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Oregon State Office

April 1985

Oregon Wilderness

Environmental Impact Statement

Volume IV

Includes Appendices for all WSAs beginning with OR-3 and OR-6 (except OR-3-114, see Volume III)

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Appendix to the Wilderness Environmental Impact Statement for Oregon

Castle Rock Wilderness Study Area (OR-3-18)

General Description of Study Area

The Castle Rock wilderness study area (WSA) is located in Malheur County, approximately 26 miles north of the community of Juntura and U.S. Highway 20 (see map 1).

The WSA contains 5,560 acres of public land (see map 2). A 640-acre inholding of split estate (federally managed surface, private or state subsurface mineral rights) is located near the center of the WSA. The study area is roughly triangular in shape and has three narrow extensions which give it a slightly irregular perimeter. It is bounded by a combination of BLM roads and private property.

The WSA lies less than 10 miles south of the Malheur National Forest and is in the foothills of the Strawberry Mountains. Most of the area is steep and has a stand of juniper. A variety of vegetative communities occur within the study area and supply habitat for a diverse population of wildlife species. The most notable physical feature of the WSA is Castle Rock. It is the highest landform within 100 miles to the south and east and 20 miles to the north and west. Castle Rock is the neck of an extinct volcano and reaches a height of 6,780 feet.

Interrelationships

Approximately 3,820 acres (69 percent) of the WSA are under BLM's Castle Rock Wildlife Habitat Management Plan. The plan is designed to maintain or improve Rocky Mountain elk and mule deer habitat found on Castle Rock. It precludes all timber removal except that which is beneficial to wildlife habitat.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- the presence of man-made features, both inside and outside the WSA,
- the presence of 640 acres of split estate in the WSA,
- the presence of a utility right-of-way (phone and powerline to a ranch) which crosses the

southeastern portion of the WSA,

- the area's mineral potential, and

- the effect of the area's small size on wilderness values.

Description of the Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

A partial alternative is not analyzed because the effects of such an alternative would not be substantially different from either the all wilderness or enhanced wilderness alternative.

All Wilderness

The all wilderness alternative would recommend all 5,560 acres as suitable for wilderness (see map 2). For purposes of analysis, it is assumed the 640-acre split-estate inholding would not be acquired.

Enhanced Wilderness

The enhanced wilderness alternative would recommend suitable as wilderness 5,335 acres of public land (see map 3). In addition, an attempt would be made to acquire the 640-acre split-estate inholding. This parcel could be acquired through purchase or exchange if the land owner is agreeable. Assuming acquisition of this parcel, total area recommended suitable would be 5,975 acres.

This alternative would also recommend the two narrow extensions, containing 225 acres in the southern portion of the WSA, as nonsuitable for wilderness designation. The boundaries between the suitable and nonsuitable portions would follow legal subdivisions (section lines).

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development,

- restriction of off-road vehicle (ORV) use to existing routes, and

- full implementation of the wildlife habitat management plan.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area would be manageable as wilderness, but if private lands adjacent to the WSA and the split-estate inholding were developed, it would be difficult to preserve wilderness values over the long term. Almost half of the WSA is bordered by private

Table 1. Summary of Proposed Management Under Each Alternative, Castle Rock WSA (OR-3-18)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	5,560	5,335	0
Acres Closed to ORVs by Wilderness Designation	5,560	5,335	0
Miles of Ways Closed	3	3	0
Acres of Split Estate Acquired [1]	0	640	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	5,560	5,335	0

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Castle Rock WSA (OR-3-18)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Adds 5,560 acres to NWPS. Maintains wilderness characteristics of highly natural area. Area would be manageable as wilderness but management would be difficult if minerals on split-estate inholding were developed.	Would add 5,975 acres to NWPS, assuming 640 acres of split-estate is acquired. Preserves wilderness characteristics in area recommended as wilderness. Acquistion of split-estate parcel would eliminate potential impairment of wilderness values due to development of this parcel.	Wilderness values could be adversely affected by potential energy or minerals development.
Energy and Mineral Development	Development precluded on 5,560 acres, including 5,560 acres with moderate potential for oil and gas and diatomite, and 3,874 acres with moderate potential for geothermal.	Development precluded on 5,335 acres, plus an additional 640 acres if acquired. Includes 5,335 acres with moderate potential for oil and gas and diatomite, and 2,610 acres with moderate potential for geothermal.	No impact.
Wood Products Harvest	Opportunity to harvest commercial timber where beneficial to wildlife would be foregone.	Same as all wilderness.	No impact.
Recreation Use	No change.	Same as all wilderness.	No change.
Economic Value and Local Income	The maximum increase in transportation costs to livestock operators would be about $16 per year.	Same as all wilderness.	No impact.

land, and some of that land is planted to agricultural crops. The croplands and farming activities can be seen from much of the western half of the WSA, and other lands within view of the WSA could also be developed. If that were to happen, it would reduce the apparent naturalness of the area.

In addition, minerals on the split-estate inholding could be developed, and this also could reduce the area's apparent naturalness. Because of the area's relatively small size and the location of the inholding near the center of the area, development of the inholding and access to it could affect a substantial portion of the area.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because it would be difficult to manage the area as wilderness and because the benefits of preserving options for development of minerals and full implementation of the wildlife habitat management plan (which includes the possible cutting of trees to benefit wildlife) outweigh the benefits of managing the area to preserve wilderness values.

The area has moderate potential for the occurrence of oil and gas, diatomite, and geothermal resources. The area does not offer outstanding opportunities for solitude, and the single major travel corridor to Castle Rock would concentrate visitor use. Most of the special features and primitive recreation opportunities are on the ridgeline and eastern slope.

The split-estate parcel is located on the southern third of the ridgeline. Development of the split-estate inholding or the adjacent private land could reduce the area's apparent naturalness to the point that wilderness management would not be warranted. The area has a moderate potential for geothermal development, and the adjacent private property has a potential for development as investment property. Two narrow extensions in the southern part of the WSA have few wilderness values and could be easily affected by developments outside the area. The relatively small size of the area would compound these problems.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Castle Rock WSA is in a substantially natural condition. Approximately 13 percent of the area is influenced by man-made features in the area. (The area of influence is an estimate of the acreage from which these man-made features can be seen.) The features include two reservoirs, four springs, one corral, an old remnant dam, 3 miles of ways (vehicle routes established and maintained solely by the passage of vehicles), 8 miles of fence, and a short telephone and electric powerline (1/2 mile). These interior developments are generally well dispersed within the study area and are substantially unnoticeable.

Outside sights and sounds include boundary roads and cultivated farm land. The steep open western slope of Castle Rock ridge is the area most influenced by the signs of man from the adjoining private property.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Due to the steep terrain and the attraction of Castle Rock, most visitors to the area would travel in a narrow corridor on the ridgeline from the north boundary of the WSA to Castle Rock. Because of this restrictive travel pattern and the relatively small size and the open western slope, the area does not offer an outstanding opportunity for solitude. Vegetative screening, found mainly on the eastern slope, and the topographic screening of the ridge provide some seclusion but do not compensate for the small size and confined use pattern.

Outstanding opportunities for day hiking, photograhy, bird watching and sightseeing exist within the WSA. The area also offers opportunities for hunting, backpacking, camping, horseback riding, rock climbing and winter sports.

Special Features

Castle Rock is one of the most prominent physical features in the region and is the focal point of interest in the WSA. It is the neck of an extinct volcano believed to have erupted roughly 15 million years ago. The rock can be viewed from 50 miles away or better and is a striking landmark.

Six plant communities occur within the study area. The WSA contains an unusually large number of different plant communities compared to most study areas in Malheur County. (They are described in the Vegetation section.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, the WSA is located in the Intermountain Sagebrush Province and has the potential natural vegetation of a sagebrush steppe. Five communities listed in the Ochoco, Blue, Wallowa Mountains section of the Oregon Natural Heritage Plan occur in the Castle Rock study area: Western juniper/bluebunch wheatgrass; Ponderosa pine/bunchgrass communities in the Blue Mountains with separate areas of Idaho fescue and bluebunch wheatgrass; bluebunch wheatgrass-Idaho fescue and Sandbergs bluegrass complex; mountain mahogany/bunchgrass; and big sagebrush/bunchgrass community inside forest zone.

There are two standard metropolitan statistical areas with populations over 100,000 within 5 hours' driving time of the WSA: Boise, Idaho, and Kennewick/Richland/Pasco, Washington.

Energy and Mineral Development

Energy and mineral resources of the Castle Rock WSA were evaluated from available geologic data by TERRADATA, a consulting firm under BLM contract. Technical details of the evaluation are incorporated in a TERRADATA report titled "Assessment of Geology, Energy and Mineral Resources of Castle Rock Geologic Resource Area (GRA)". A reevaluation of the report was done by BLM geologists.

The WSA is within the Castle Rock geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Oil and gas and geothermal are the two potential energy resources in the area. The entire WSA is considered moderately favorable for oil and gas and the southern part is considered moderately favorable for geothermal. However, as of January 1984, there were no oil and gas or geothermal leases.

Because of youthful volcanism and above-normal heat flow, much of southeastern Oregon is generally considered favorable for thermal waters for direct-use heat application. Smaller areas are favorable for high-temperature geothermal resources. None have been identified within the WSA.

Oil and gas potential will largely depend on the presence or absence of suitable marine rocks at depth. There has been no deep drilling in the vicinity which has penetrated the Tertiary volcanic cover.

There is a potential for diatomite at depth. However, because of the common occurrence of this commodity, there is very little likelihood that there will be any exploration or development of diatomite from within the WSA. The entire WSA is rated moderate for diatomite.

As of January 1, 1984, there were no mining claims located within the WSA or in the vicinity.

Details of the mineral potential classifications in the WSA are shown in table 3. Map 3 shows the area rated moderate (medium) for geothermal resources.

Rocks exposed within the WSA consist of well- to semi-consolidated tuffaceous sedimentary beds with bedded silicic ash and pumice of lacustrine (lake) and fluvial (river) deposits. There are numerous flows of rhyolite, basalt and andesite and local terrace gravels. All of these Tertiary volcanic and volcanically derived rocks are underlain by Mesozoic metamorphic rocks of unknown depth. The nearest known mineral deposits of possible economic value are extensive deposits of diatomite located about 20 miles east of the WSA around Westfall; but there are no known mineral deposits within or around the WSA.

Table 3. Classification of Energy and Mineral Potential,Castle Rock WSA (OR-3-18)

Commodity	Area	Classification Level	Confidence Level
Metals	Entire WSA	1	A
Geothermal	See map 3	3	C
	Rest of WSA	1	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	A
Diatomite	Entire WSA	3	A
Zeolites	Entire WSA	2	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Vegetation

A variety of vegetation communities occur in the WSA which are typical of higher elevation sagebrush steppe ecosystems bordering forest zones. The ecological condition is primarily early seral in the southern reaches of the WSA. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) In the rest of the WSA, vegetation is mid to late seral.

The two major climax vegetation communities which occur in the area are a bluebunch wheatgrass/Idaho fescue association and a mountain big sagebrush/Idaho fescue/bluebunch wheatgrass. Other plant communities in the area include ponderosa pine/bunchgrass, mountain mahogany, and ponderosa pine/Douglas fir. Scattered junipers and quaking aspen occur in the area as well.

Wildlife

The Castle Rock WSA has high quality big game summer range. Cover, water and forage are all available in sufficient quantities and support mule deer and elk in the WSA. Forest canopy cover and high quality forage are key habitat elements which encourage big game to use the area.

Antelope may occasionally use the area, but it is not considered preferred antelope range.

A diverse community of upland game birds use the area. Sage grouse, blue grouse, chukar and California quail are all found in the area. Two reservoirs in the Horse Flat vicinity attract waterfowl. Emergent and meadow-type vegetation supplies cover and food for waterfowl.

Non-game wildlife are abundant and diverse. Reservoirs and the forest canopy cover are key habitat components that make the area especially productive.

Livestock Grazing

Portions of two grazing allotments are within the WSA. Table 4 summarizes existing livestock use in AUMs (animal unit months, the amount of forage required to sustain a cow and calf, or equivalent animals, for one month).

No range improvements are proposed for the WSA. Existing livestock projects (among the man-made features listed in the Naturalness section) include 2 reservoirs, 4 springs, and 8 miles of fencing.

Livestock operators use vehicles to place salt and to check livestock on the periphery of the area. Horses are normally used to check livestock inside the area and to move livestock to and from the area.

Wood Products Harvest

Approximately 236 acres of the WSA support commercial forest land producing an estimated 40,000 board-feet (40 Mbf) of harvestable timber per year. The Castle Rock wildlife habitat management plan and the Northern Malheur Resource Area land use plan identify this area as closed to commercial harvest except where timber removal would be beneficial to wildlife. At present, cover characteristics in the area are such that harvest would not be beneficial to wildlife for several decades.

Recreation Use

The primary recreational activity within the WSA is hunting. Deer, elk and upland game birds are the most hunted animals. Hunters travel in and through the study area by off-road vehicles, horses and on foot. Vegetation and topography somewhat limits shooting opportunities once game is flushed.

Table 4. Existing Livestock Use, Castle Rock WSA (OR-3-18)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)
Castle Rock (No. 0211)	5,935	Mar. - July July - Nov.	13	1,086
DeArmond/Murphy (No. 0206)	6,485	July - Oct. Mar. - Nov.	5	217
Totals	12,420			1,303

Other recreation activities account for low use. These include day hiking, backpacking, camping, winter sports, photography, bird watching and sightseeing. Visitors occasionally hike to the summit of Castle Rock for the excellent view.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas or geothermal leases on the WSA.

The WSA currently produces 1,303 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually. No other resource outputs are expected to change the current situation.

The economic value of existing outputs amounts to $9,825 annually, and local personal income generated by existing outputs amounts to $20,952 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

Under the **all wilderness alternative**, 5,560 acres would be added to the National Wilderness Preservation System (NWPS).

Wilderness designation would preserve the study area's natural character, outstanding opportunities for primitive recreation, and special wilderness features unless adjacent private land or minerals in the split-estate inholding were developed. Development of the split estate could jeopardize natural values as a result of the construction of facilities and new roads. Development on adjoining private lands could also adversely affect the naturalness of the area.

The **enhanced wilderness alternative** would add 5,975 acres to the NWPS, assuming the 640-acre parcel of split estate could be acquired.

Under the enhanced wilderness alternative, the acquisition of the split-estate inholding would remove the potential for impairment of wilderness values because of mineral development on the parcel. However, the potential for impairment of wilderness values by development of adjacent private lands would remain. The limited wilderness values on the narrow extensions recommended as nonsuitable could be adversely affected by development activities on or adjacent to the area.

Under the **no wilderness/no action alternative**, construction of roads and other activities associated with mineral development could adversely affect the area's naturalness and special wilderness features. Opportunities for primitive recreation activities could also suffer from such development. Mining and oil and gas development change the landscape and could degrade the visual qualities of the area. No new BLM developments are planned in the WSA, so the naturalness of the area would remain unchanged unless mineral development occurred.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 5,560 acres under the **all wilderness alternative**; and 5,560 acres, plus an additional 640 acres if the split-estate land is acquired, as proposed under the **enhanced wilderness alternative**. These withdrawals would include the area rated moderate for oil and gas and diatomite which encompass the entire WSA, and 3,315 acres rated moderate for geothermal.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Wood Products Harvest

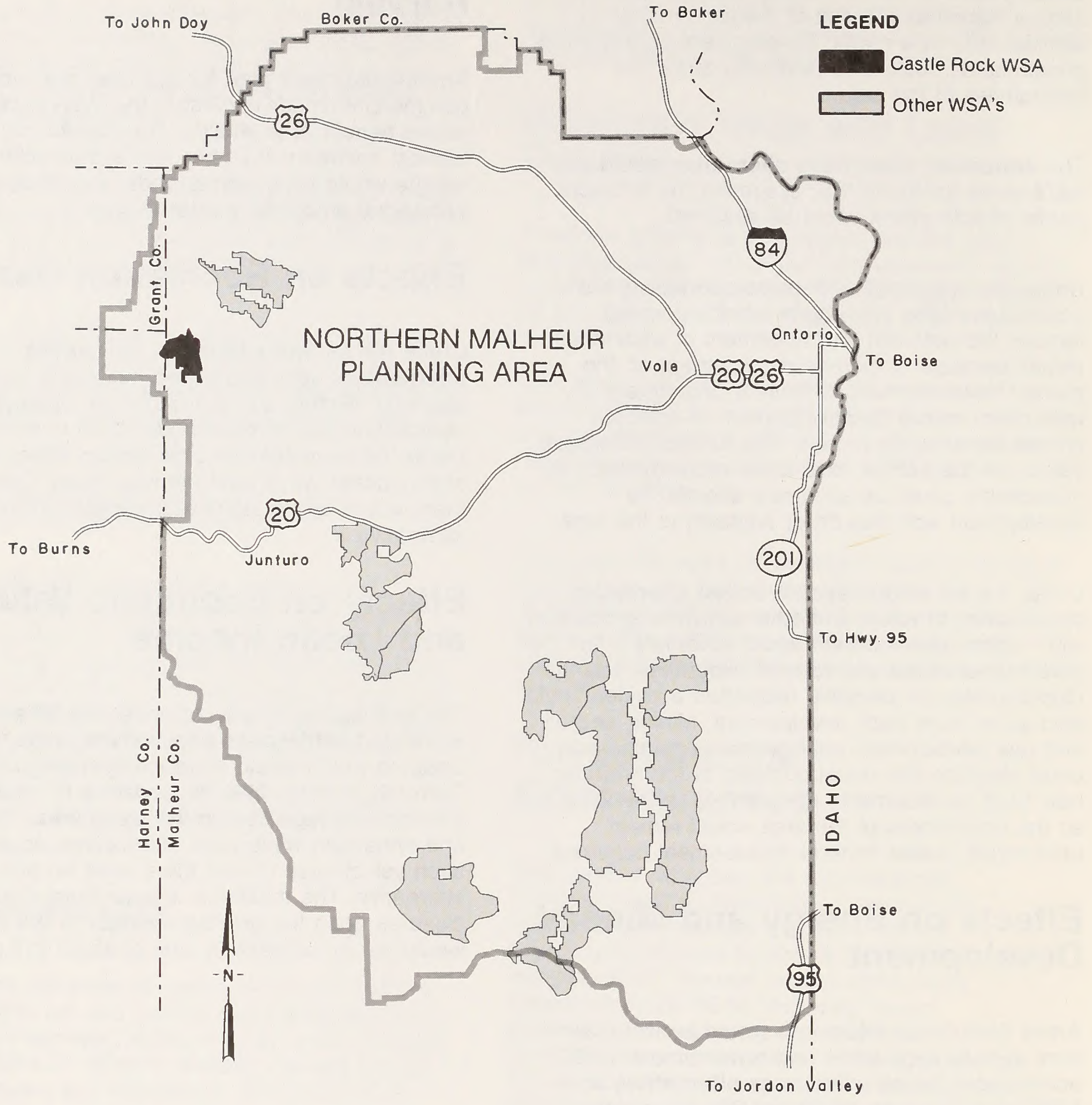
The management plan for this area precludes commercial timber harvest in the WSA except where beneficial to wildlife. The opportunity to harvest commercial timber where beneficial to wildlife would be foregone under the **all and enhanced wilderness alternatives**.

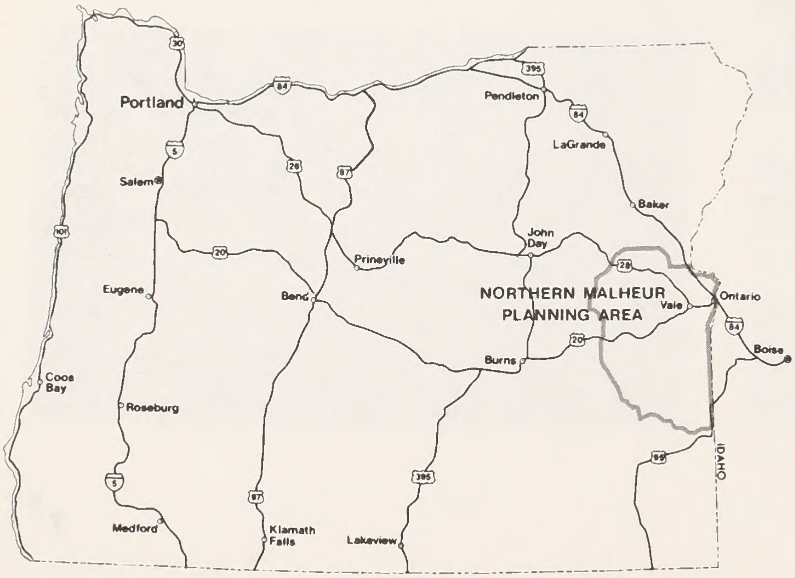
Effects on Recreation Use

Under the **all and enhanced wilderness alternatives**, vehicle-oriented recreation would decrease slightly due to the closure of ways. Vehicle-oriented recreation would be unaffected under the **no wilderness/no action alternative** since access ways would remain open. Overall, there would be no significant impact from any alternative.

Effects on Economic Value and Locan Income

The only economic effects under the **all and enhanced wilderness alternatives** result from road closures which would increase operating costs. Currently, there is little dependence on vehicles for livestock management in the study area. The all and enhanced wilderness alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $16 per year.





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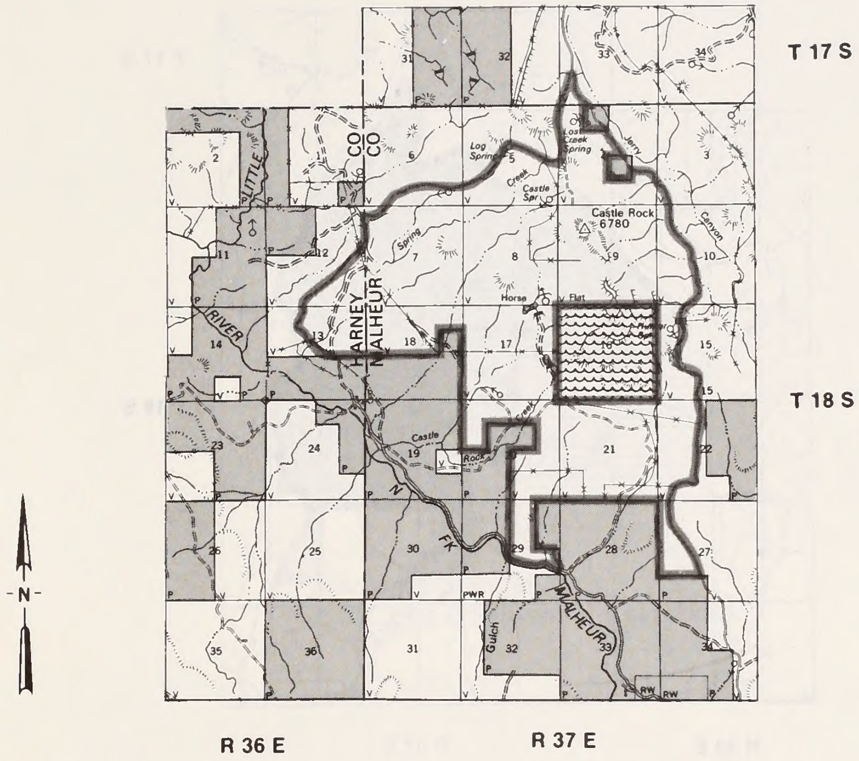
Castle Rock WSA
OR-3-18

LOCATION MAP

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

U.S. Department of the Interior
Bureau of Land Management

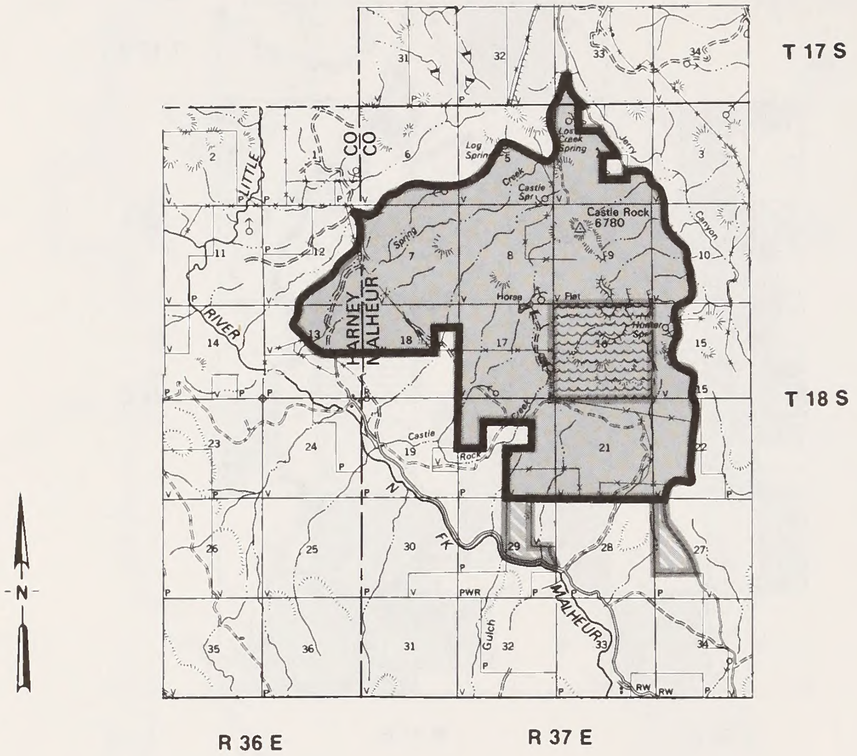
Vale District

Castle Rock WSA
OR-3-18

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

■ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

U.S. Department of the Interior
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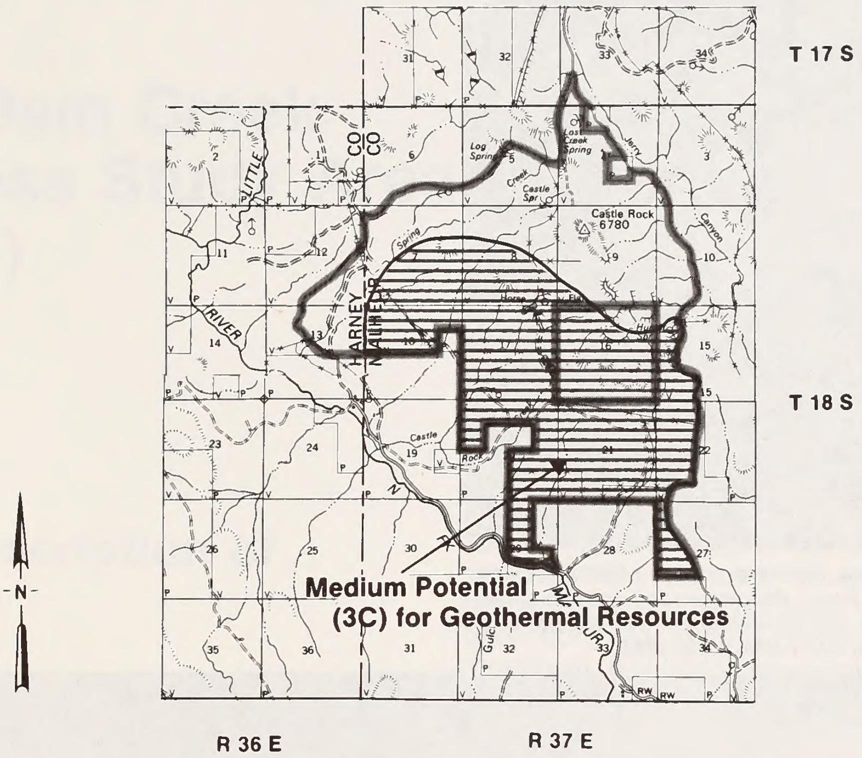
Vale District

Castle Rock WSA
OR-3-18

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



Entire WSA:
Medium Potential
(3B) for Oil and Gas
(3A) for Diatomite

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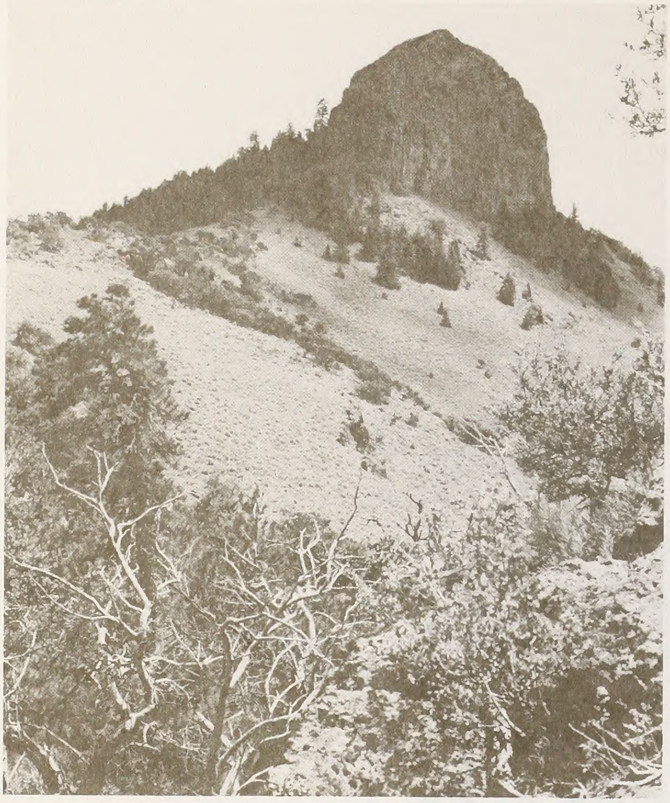
Vale District

Castle Rock WSA
OR-3-18

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



Castle Rock WSA, OR-3-18. Northern portion of WSA looking southeast toward Castle Rock. Recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. July 1983.

Castle Rock WSA, OR-3-18. Southern portion of WSA looking north at Castle Rock (to the left center). Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. Includes some split-estate land to the right of Castle Rock at the end of the ridge. July 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Beaver Dam Creek Wilderness Study Area (OR-3-27)

General Description of Study Area

The Beaver Dam Creek wilderness study area (WSA) is located in Malheur County approximately 14 miles south of the town of Ironside and U.S. Highway 26 (see map 1).

The WSA contains 19,140 acres, all of it public land (see map 2). The study area is roughly horseshoe shaped with boundaries comprised of roads and adjacent private land or split-estate (federally managed surface, state or privately owned subsurface mineral rights). Adjoining land ownership is largely private and makes up more than 50 percent of the area boundary. State and private parcels along Bully Creek protrude deeply into the WSA and account for the horseshoe configuration of the study area. Two parcels totaling 440 acres of split-estate land form a portion of the boundary along Bully Creek. One dead-end road enters the study area, forming part of the boundary, and terminates at Kitten Canyon Reservoir.

The study area has a complex, mountainous appearance due to numerous ridges and draws. Land elevation is generally higher towards the north. The highest point is in the vicinity of Sheep Rock at 5,902 feet. Numerous intermittent and perennial drainages empty into Bully Creek which runs through the middle of the WSA.

Juniper grows in much of the area. Quaking aspen occupies many sites near streams. A few ponderosa pine grow on some of the slopes. Understory vegetation is comprised largely of big sagebrush, bluebunch wheatgrass and Idaho fescue.

Interrelationships

The U.S. Soil Conservation Service has a snow survey marker located within the study area, which is checked periodically by aircraft during the winter to determine snow depths. (Snow surveys provide information on snow moisture content for water supply forecasts.) Snow measurements by aircraft would be allowed to continue in wilderness as an established practice. Any other means of snow measurement or maintenance of snow survey markers would have to be by primitive means, such as by horseback or on foot. (Impacts on snow measurement surveys are not discussed further in this appendix.)

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- state and private lands adjacent to the WSA (the effects of wilderness designation on private lands are addressed in the Statewide EIS volume),

- potential for mineral development, and

- the need for vehicle access to a snow marker for maintenance and ground checking by the Soil Conservation Service.

Also raised as an issue was whether the WSA is suitable for wilderness given its present configuration.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (preferred alternative)

Partial and enhanced wilderness alternatives are not analyzed for the Beaver Dam Creek WSA. No major resource conflicts could be resolved by recommending a portion of the WSA suitable under a partial alternative and there are no opportunities to improve manageability by recommending acquisition of inholdings or closing the one dead-end road under an enhanced wilderness alternative.

All Wilderness

The all wilderness alternative would recommend all 19,140 acres of public land in the WSA suitable for wilderness (see map 2). The dead-end road would remain open to vehicles.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development, and

- continued vehicle use, limited to existing routes.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area would be manageable as wilderness, but it would be difficult to preserve wilderness values if adjacent private land were developed.

Private property nearly divides the WSA along Bully Creek, producing narrow extensions in the southwestern and northwestern portions which are a mile or less wide and two to four miles long. Wilderness values would be difficult to manage in these extensions because an absence of screening subjects them to influences from outside man-made sights and sounds. Over half of the boundary is formed by private property, and development of that property could result in a substantial increase in outside sights and sounds. Most of the adjacent private property is located along Bully Creek, in the center of the WSA, and along the northwest and southwest boundaries.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of retaining options for development of resources (including diatomite and possibly oil and gas) and keeping the area open to

Table 1. Summary of Proposed Management Under Each Alternative, Beaver Dam Creek WSA (OR-3-27)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	19,140	0
Acres Closed to ORVs by Wilderness Designation [1]	19,140	0
Miles of Ways Closed	9	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	19,140	0

Table 2. Summary of Environmental Consequences of Alternatives Beaver Dam Creek WSA (OR-3-27)

Resource or Activity	All Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 19,140 acres added to the NWPS. Includes several intermittent drainages, conifer and deciduous tree cover and excellent wildlife habitat. Provides good quality environment for day hikers, backpackers and general outdoor enjoyment. Closure of 9 miles of ways would increase naturalness and improve opportunities for solitude. The area would be manageable as wilderness, but management could be difficult.	Opportunities for solitude and primitive recreation could be reduced, and naturalness and special wilderness features could be adversely affected by mineral development.
Energy and Mineral Development	Development precluded on 19,140 acres, including 19,140 acres with moderate potential for oil and gas and diatomite, and 2,040 acres with moderate potential for gold.	No impact.
Livestock Grazing	No significant impact. Some inconvenience to livestock operators possible.	No impact.
Recreation Use	Inconvenience to visitors as a result of closed ways. Little change in recreation use.	Allows use of existing routes. No change in recreational use.
Economic Value and Local Income	The maximum increase in transportation costs to livestock operators would be about $150 per year.	No impact.

the use of vehicles by hunters would outweigh the benefits of preserving the area's wilderness values. This is particularly the case in view of the limited number of wilderness values in the open southwestern and eastern portions of the WSA and the potential manageability problems posed by the area's irregular shape and the large amount of adjacent private land.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that would be affected by either of the alternatives.

Wilderness Values

Naturalness

The Beaver Dam Creek WSA is in a highly natural condition. About 16 percent of the study area is influenced by man-made features within the WSA. (The area of influence is an estimate of the acreage from which the features can be seen.) The majority of these man-made features are located in the northeast half of the area and consist of five fences totaling 18 miles, 15 ways (vehicle routes established and maintained solely by the passage of vehicles) totaling 9 miles, 4 developed springs, 2 reservoirs, and the ruins of an old cabin. The dead-end road to Kitten Canyon Reservoir detracts from the naturalness of the open slopes of the canyon in which it is located.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Due to good screening by topographic features and vegetation in the north-central portion of the study area, there are outstanding opportunities for solitude. Junipers are scattered throughout the area, and pockets of aspen grow in the drainages. There are few outside sights and sounds from activity on boundary roads and private property along Bully Creek, except during deer hunting season.

The north-central portion of the area provides outstanding opportunities for primitive recreation. Bully Creek and its tributaries (McArthur, Godding, Beaver Dam, Steamboat, South and North Bully Creeks) provide varying topography and opportunities for relatively unrestricted foot travel. Hikers will find opportunities throughout the area for viewing geologic, zoologic, and botanic attractions. Destination backpacking and camping would be associated with the perennial waters of Bully Creek and its tributaries. Beaver dams, aspen groves, seeps and springs within juniper and aspen stands would provide the focal points for campers.

There are above average opportunities to hunt deer in most of the study area. Two small areas in the Bully Creek drainage offer good opportunities to hunt chukars, Hungarian partridge and quail. Opportunities exist for horseback travel throughout travel throughout the WSA. Several reservoirs, developed springs and seeps in the drainages provide water for horses. The drainages are good areas for observing birdlife associated with riparian habitat.

Numerous opportunities exist for sightseeing and photographing zoologic, botanic, and scenic attractions within the area. Cross country skiing and snowshoeing during adequate snow years are possible but such conditions occur sporadically.

Special Features

The area is located almost entirely in a juniper steppe woodland, which is a transition zone (ecotone) between the ponderosa pine forest and sagebrush steppe.

Much of the area consists of rolling sagebrush hills that support western juniper and patches of mountain mahogany. The interspersion of these plant communities increases wildlife habitat edge, and consequently the diversity of the natural community. Wildlife varies from forest nesting goshawks to sage thrashers and from antelope to rocky mountain elk.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the study area is in the Intermountain Sagebrush Province and the potential natural vegetation is sagebrush steppe. Of the plant communities listed in the Ochoco, Blue and Wallowa Mountains sections of the Oregon Natural Heritage Plan, the WSA includes bluebunch wheatgrass/Idaho fescue and Sandberg's bluegrass complex and the big sagebrush/bunchgrass community inside the forest zone. (Because only communities listed in the ONHP are included here, this list varies somewhat from the complete list of vegetative communities cited in the following vegetation section.)

There are two standard metropolitan statistical areas with populations over 100,000 within 5 hours' driving time of the WSA: Boise, Idaho, and Kennewick/Richland/Pasco, Washington.

Energy and Mineral Development

Energy and mineral resources of the Beaver Dam Creek WSA were evaluated from available geologic data by TERRADATA, a consulting firm under contract with BLM. Technical details of the findings of the evaluation are incorporated in a report titled "Assessment of Geology, Energy, Mineral Resources of Castle Rock Geologic Resource Area". A reevaluation of this study area was done by Barringer Resources, Inc., supplemented by geochemical stream sediments sampling under a BLM contract in September 1984.

The WSA is within the Castle Rock geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals as well as the amount and quality of data on which the rating was based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is considered to be moderately favorable for oil and gas and a portion moderately favorable for gold. The probability of oil or gas occurrence will largely depend on the presence or absence of suitable marine rocks at depth. There has been no deep drilling in the area.

There is a moderate potential for diatomite at depth, but because of the widespread occurrence of this commodity at or near the surface elsewhere, there is little likelihood of exploration or development within the WSA.

As of January 1, 1984, there were seven mining claims associated with diatomite and zeolites in the northwestern part of the WSA. There were no oil and gas or geothermal leases in the WSA, as of January 1, 1984.

Table 3 shows the mineral potential classifications for the WSA. Map 3 shows the portion rated moderate for gold.

The geology of the WSA is comprised of alluvium, outcrops of Tertiary basalts, rhyolites and andesites along with terrace gravels. The northwest reaches of the WSA display outcrops of older pre-Tertiary rocks that probably underlie the entire WSA. There are no known mineral deposits within or around the

Table 3. Classification of Energy and Mineral Potential, Beaver Dam Creek WSA (OR-3-27)

Commodity	Classification Area	Classification Level	Confidence Level
Metals (Gold)	See Map 3	3	B
	Rest of WSA	1	A
Geothermal	Entire WSA	1	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	A
Diatomite	Entire WSA	3	A
Zeolites	Entire WSA	2	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

WSA. The nearest known mineral deposits of possible economic value are extensive deposits of diatomite located around Westfall about 15 miles east of the WSA.

Vegetation

Vegetation throughout the WSA is characteristic of higher elevation sagebrush steppe ecosystems bordering forest zones. The vegetation is predominantly late seral in a majority of the study area. (Seral refers to the stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage.)

A bluebunch wheatgrass/Idaho fescue community is the major climax vegetation in the WSA. Numerous other plant communities occur throughout the area, including a sagebrush/Sandberg's bluegrass community and a bluebunch wheatgrass/Thurber's needlegrass community. Stands of quaking aspen occur in pockets along drainages and in steep canyons. Scattered individuals of ponderosa pine are found along slopes below ridge lines, and stands of western juniper are scattered throughout the area.

Wildlife

In general the study area provides some of the best quality spring/summer/fall range for mule deer and elk in northern Malheur County.

Elk occupy a small portion of Malheur County, and elk use in the WSA is moderate. Population levels in the general area have been on an upward trend in recent years. Juniper and aspen stands provide good hiding and thermal cover for elk on a yearlong basis.

Mule deer use in the study area is heavy compared to much of Malheur County. Cover, forage and water are all available in sufficient quantities to encourage higher than average use by deer. Winter use normally occurs outside of the study area.

Antelope occupy the lower reaches of the WSA to some degree but most of the area is not preferred antelope habitat.

Upland game bird populations are diverse and include chukar, sage grouse, mourning dove and probably a few blue grouse.

Due to the abundance of water and tree cover, there is a better than average density and variety of nongame wildlife in the area, including beaver, western skink, and a variety of birds. Perennial streams probably support nongame fish but no known sport fish.

Livestock Grazing

Portions of five grazing allotments are located within the WSA. Table 4 summarizes existing livestock use in AUMs (animal unit months, the amount of forage

Table 4. Existing Livestock Use, Beaver Dam Creek WSA (OR-3-27)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)
Willow Basin (No. 0222)	6,385	June -Sept.	23	1,753
Rail Canyon (No. 0205)	3,023	June -Sept.	27	908
Clover Creek Individual (No. 0210)	453	April-Sept.	2	47
Castle Rock (No. 0211)	4,187	June -Sept.	1	43
DeArmond/Murphy (No. 0206)	4,968	April-Sept.	1	31
Totals	19,016			2,782

needed to sustain a cow and calf, or equivalent animals, for one month).

Existing livestock projects (among the man-made features mentioned in the Naturalness section) are 18 miles of fence, 3 spring developments, and 2 reservoirs.

No new livestock projects are proposed within the WSA.

Livestock operators use vehicles in the study area to place salt and check livestock. Horses are also used to check and move livestock.

Recreation Use

The primary recreational activity within the WSA is hunting. Deer, elk and upland game birds are all hunted. Hunters use vehicles on the numerous ways in the study area.

Except for hunting, the area is currently receiving very little recreation use for day hiking, backpacking, camping, winter sports, photography, bird watching and sightseeing.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 2,782 animal unit months (AUMs) of livestock forage, and an unknown amount of recreation activity annually. No economically significant changes in outputs are expected.

The economic value of existing outputs amounts to $20,976 annually, local personal income generated by existing outputs amounts to $44,734 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources or activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

Under the **all wilderness alternative**, 19,140 acres would be added to the National Wilderness preservation System. Wilderness designation would preserve a scenic area with a variety of forest, brush, and grassland vegetation; numerous intermittent creeks; and a variety of wildlife. The area's generally natural condition would be maintained with some enhancement due to natural revegetation of 9 miles of ways that would be closed. Opportunities for primitive recreation would be preserved.

The area's opportunities for solitude would remain unchanged as long as adjacent private land was not developed. The greatest potential for adverse impacts to solitude would probably occur near the middle of the study area on adjacent private land along Bully Creek. The WSA's special features would be unchanged.

Under the **no wilderness/no action alternative,** the area's naturalness and special wilderness features would change very little unless significant mining or oil and gas development occurred. The area's opportunities for solitude and primitive recreation could also be adversely affected by mineral developement. Canyons which presently offer outstanding opportunities for solitude could be subject to new road construction for the purpose of mineral exploration and development. Development of adjacent private lands could also adversely affect the area's wilderness values.

Effects on Energy and Mineral Development

Under the **all wilderness alternative**, 19,140 acres would be withdrawn from mineral exploration and development. This includes the areas rated moderate for oil and gas and diatomite, which encompass the entire WSA, and approximately 2,040 acres rated moderate for gold.

No acreage would be withdrawn under the **no wilderness/no action alternative.**

Effects on Livestock Grazing

Under both the **all wilderness and no wilderness/no action alternatives**, livestock grazing would remain at approximately existing levels. Under the all wilderness alternative, motor vehicles would not be permitted for livestock management unless there were no practical alternatives.

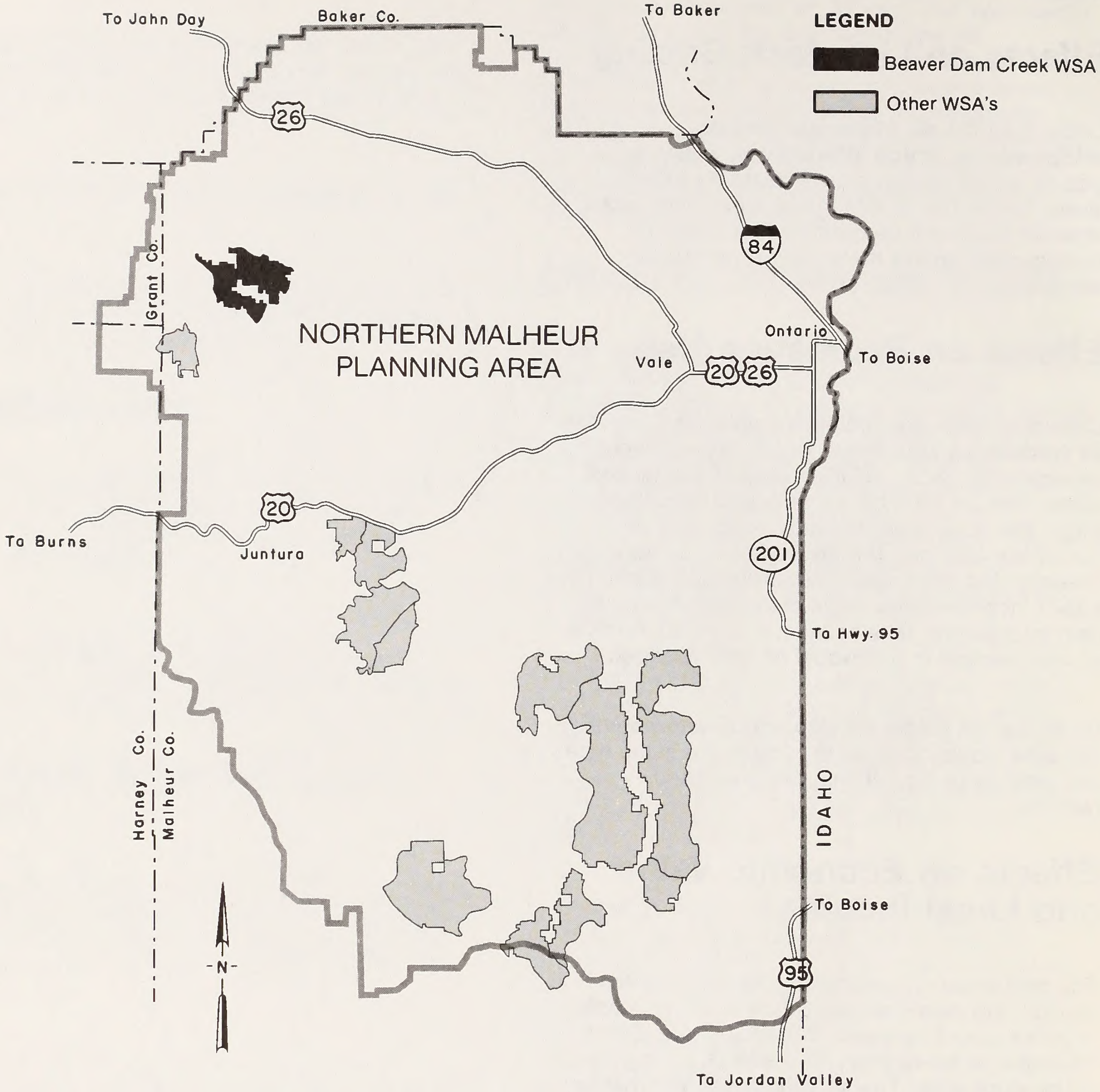
Effects on Recreation Use

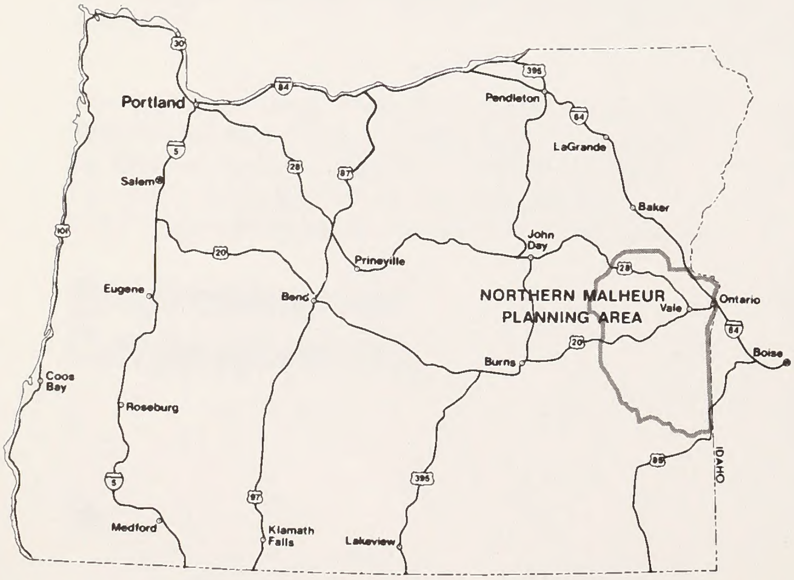
Closure of ways and prohibiting vehicles under the **all wilderness alternative** would inconvenience visitors to the WSA. Vehicles would have to stop some distance from the more popular locations within the study area. Hunters would walk or horsepack into their favorite camps or camp in less desirable but more easily accessible locations. The added inconvenience might discourage some, but deer populations would continue to attract hunters, so total recreation use would be little changed.

Under the **no wilderness/no action alternative**, the WSA would continue to receive the same type and amount of recreational use it presently receives.

Effects on Economic Value and Local Income

The only economic effects for the alternatives results from road closures which would increase livestock operating costs. Currently, there is little dependence on vehicles for livestock management in the study area. The **all wilderness alternative** would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $150 per year.





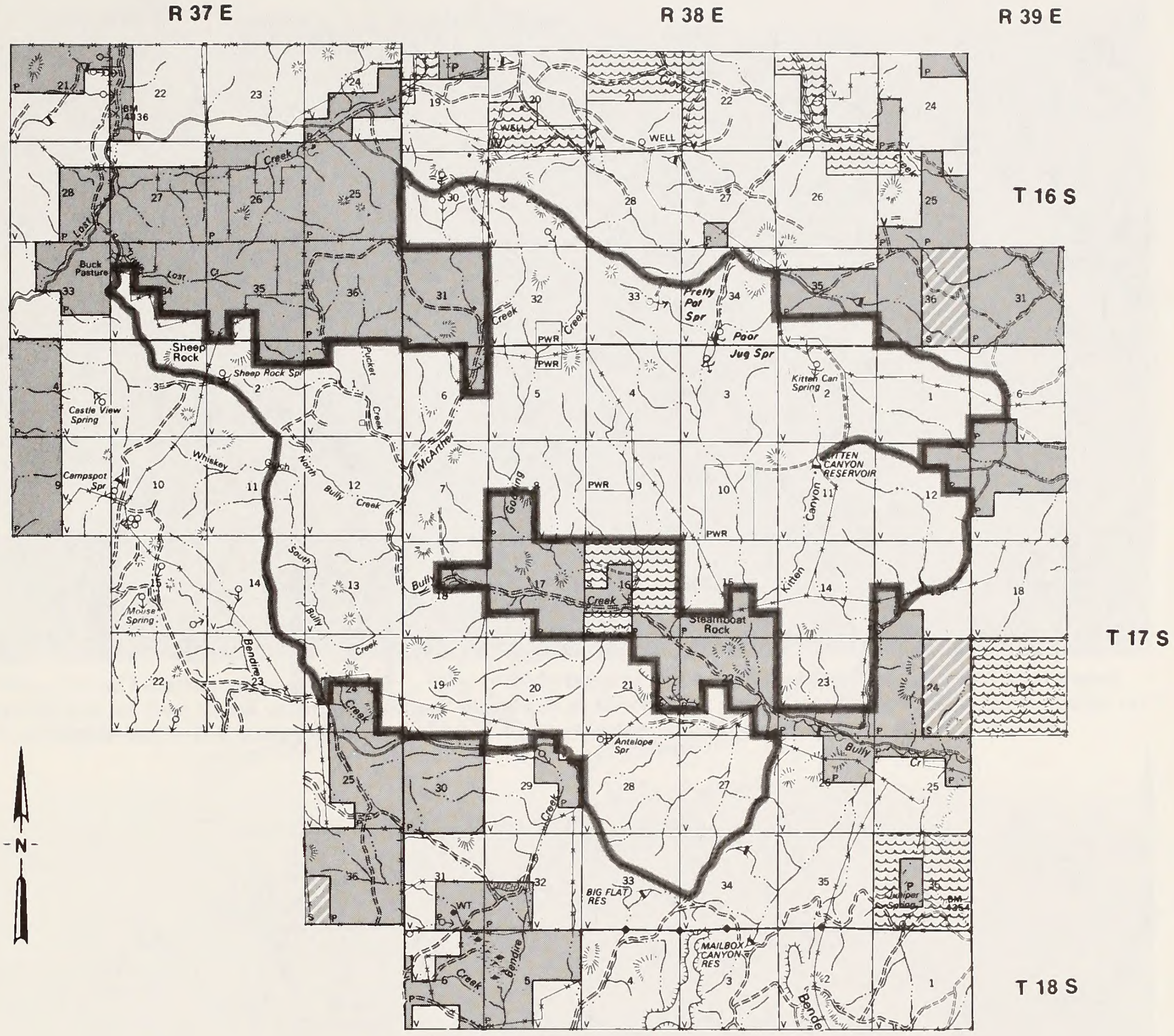
U.S. Department of the Interior
Bureau of Land Management
Vale District

Beaver Dam Creek WSA
OR-3-27

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ State

■ Private

≋ BLM Surface-State or Private Subsurface (Split Estate)

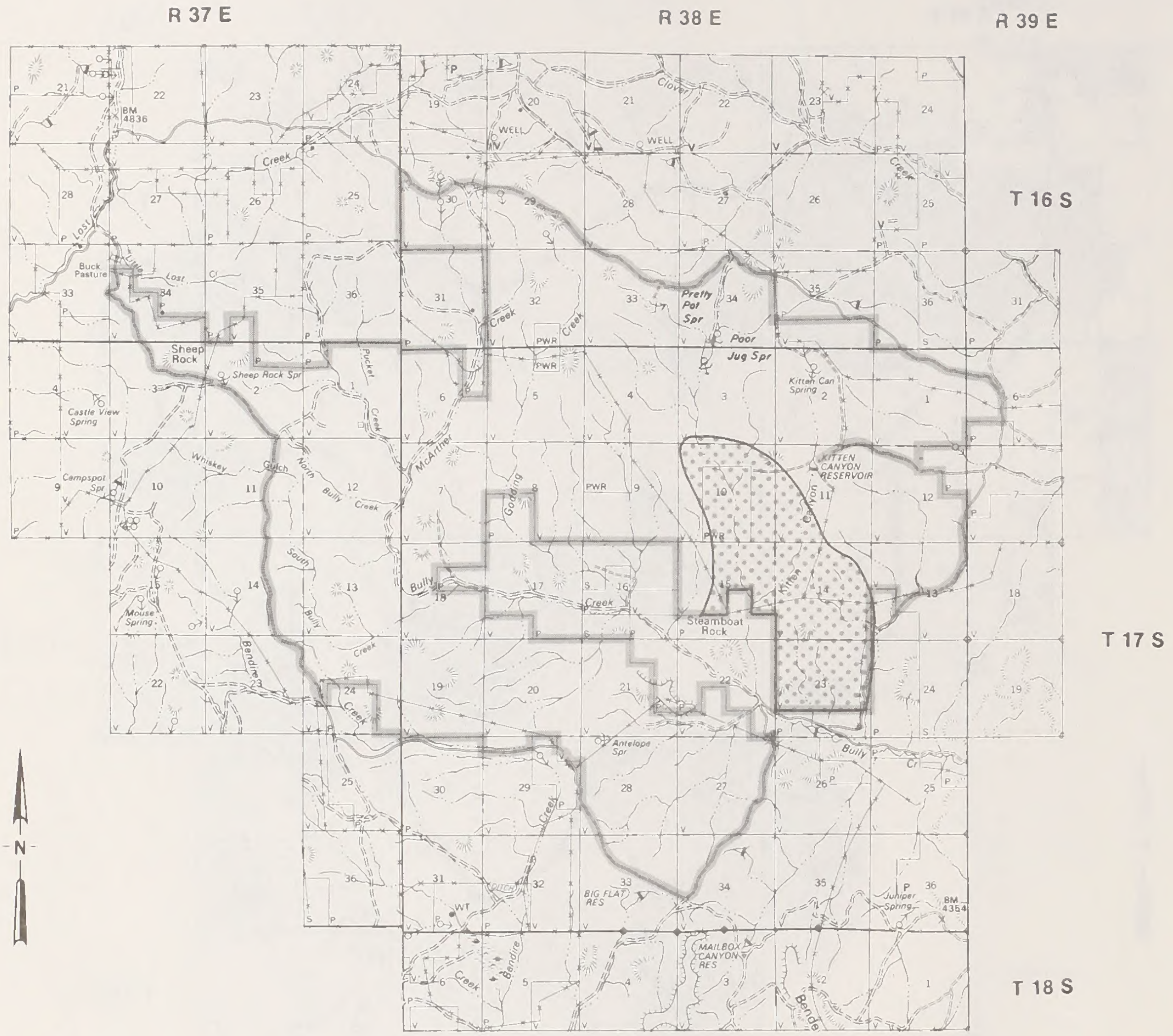
U.S. Department of the Interior
Bureau of Land Management
Vale District

Beaver Dam Creek WSA
OR-3-27

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▨ **Medium Potential (3B) for Gold**

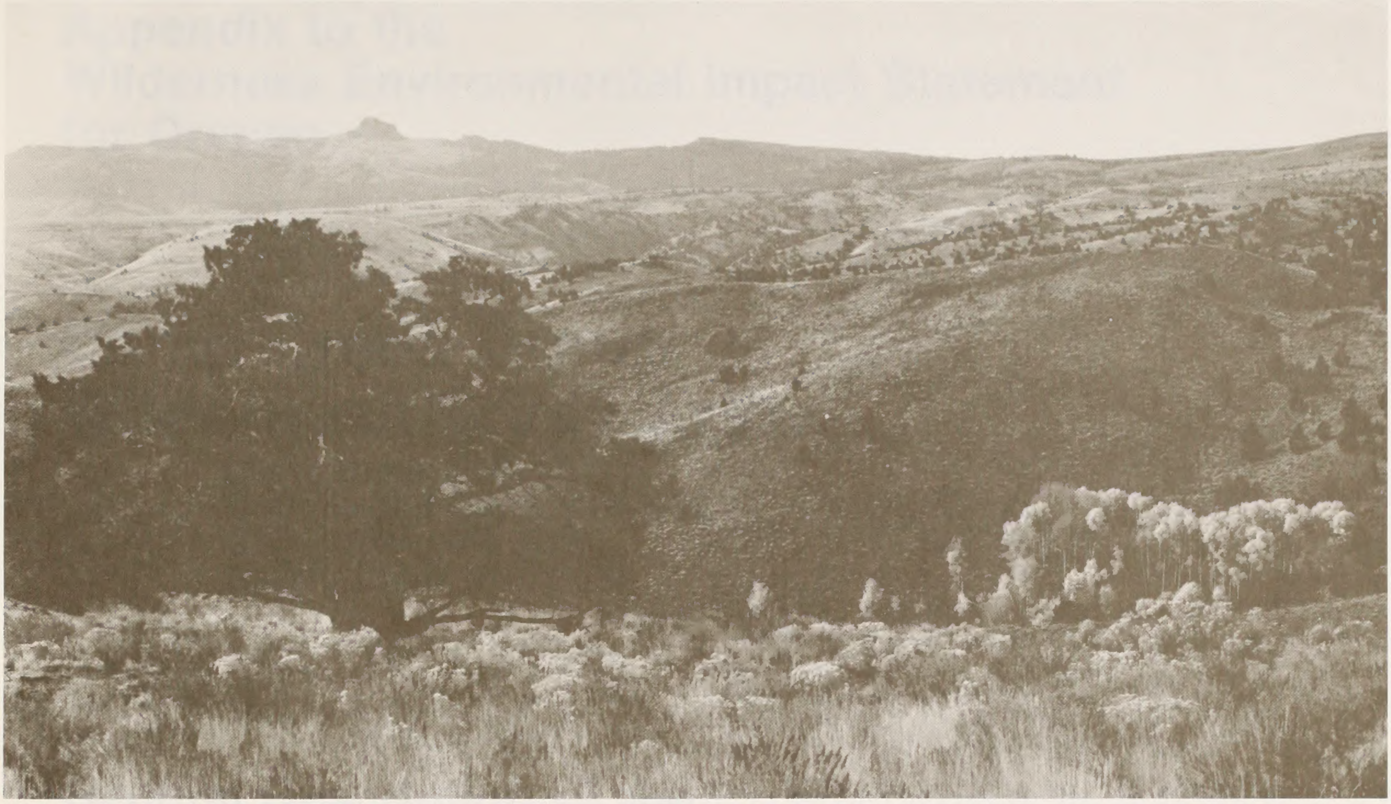
U.S. Department of the Interior
Bureau of Land Management
Vale District

Beaver Dam Creek WSA
OR-3-27

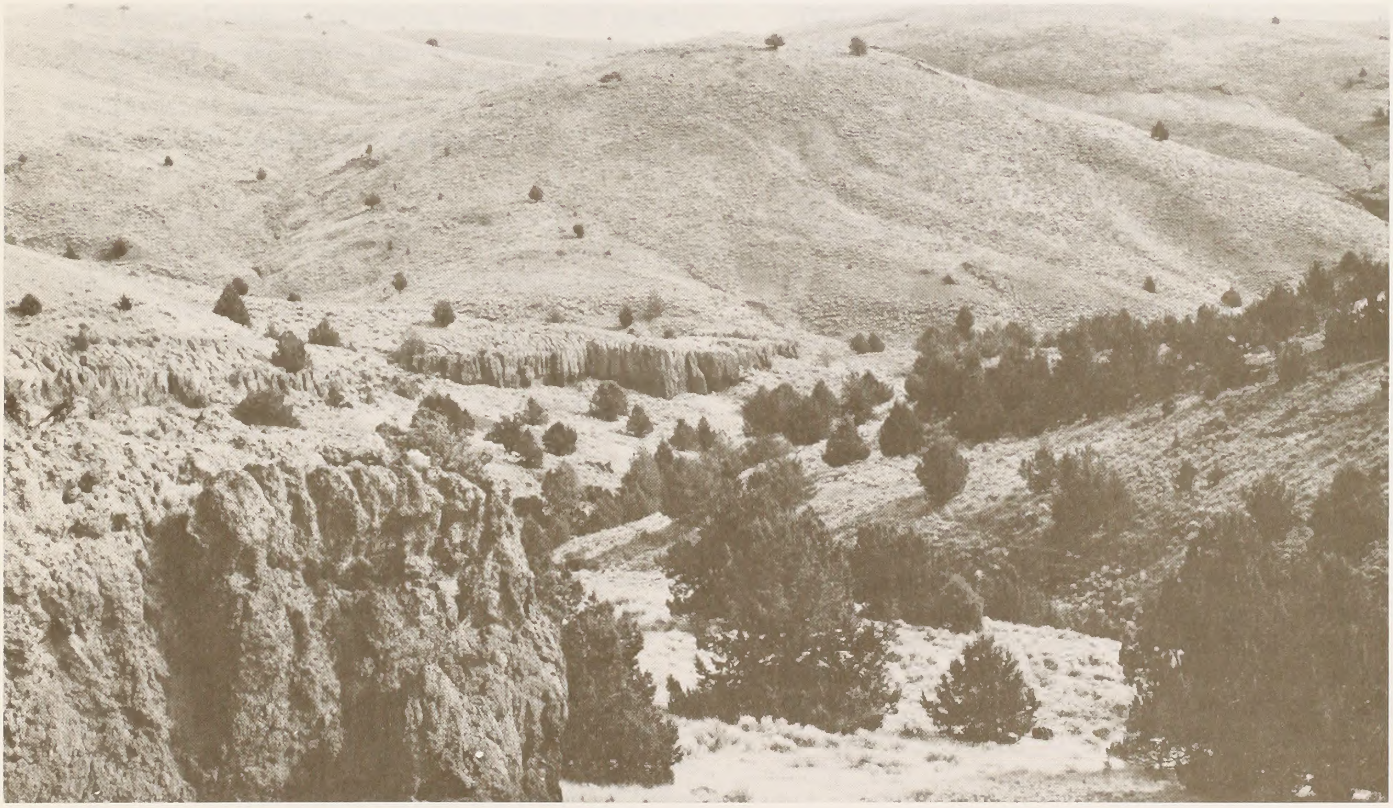
MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 3



Beaver Dam Creek WSA, OR-3-27. Central portion of WSA looking southwest across Beaver Dam Creek drainage. Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. Pinto Springs is at aspen grove at lower right. Castle Rock ridge (OR-3-18) is visible on horizon to the left. October 1983.



Beaver Dam Creek WSA, OR -3-27. Central portion of WSA looking east at Steamboat Rock in Steamboat Creek drainage. Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. October 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Camp Creek Group Wilderness Study Areas

Camp Creek (OR-3-31)
Cottonwood Creek (OR-3-32)
Gold Creek (OR-3-33)
Sperry Creek (OR-3-35)

General Description of the Study Area

The Camp Creek, Cottonwood Creek, Gold Creek, and Sperry Creek wilderness study areas (WSAs) are in Malheur County, approximately 32 miles southwest of Vale and from 14 miles to immediately south of U.S. Highway 20 (see map 1).

All of the surface and mineral estate within the boundaries of the four WSAs is publicly owned (see map 2). The southernmost WSA, Cottonwood Creek, shares a 6-mile common road boundary along Cottonwood Creek Canyon with the Camp Creek WSA. Immediately north of the Camp Creek WSA across a 2-mile common road boundary is the Gold Creek WSA. To the west of the Gold Creek WSA along a 4-mile common road boundary is the Sperry Creek WSA.

The size and shape of the WSAs vary considerably. Camp Creek WSA is oblong with a narrow, forked extension in the southern portion along the two forks of Cherry Creek Canyon. The WSA is approximately eight miles long, four miles wide and contains 18,360 acres. It is bordered on the east by one parcel of private property and a BLM road that follows Cottonwood Creek, on the south by a rim, split estate (federally managed surface, state or privately owned subsurface mineral rights) and private property, and on the west and north by a BLM road, a county road, split-estate land and one parcel of private property.

Cottonwood Creek WSA is also oblong, approximately eight miles long, but only two miles wide, and contains 8,500 acres. The study area is bordered on the north and west by a BLM road that parallels Cottonwood Creek and Alder Creek, on the south by split-estate land, rims and ridges, and on the east by a BLM road. A 40-acre parcel of private land abuts the western boundary and a 280-acre private parcel abuts the eastern boundary.

Gold Creek WSA is shaped like a horseshoe, approximately five miles wide and seven miles long and contains 12,920 acres. The study area is bordered on the west and south by BLM roads, on the east by a way (a vehicle route established and maintained solely by the passage of vehicles), two parcels of split estate and a parcel of private property, and on the north by private property and U.S. Highway 20. The two parcels of split estate adjacent to the eastern boundary total 680 acres. Adjacent to the northern boundary lies a 10-acre highway gravel stock pile area. A 1/2-mile-long dead-end road enters the WSA from the southern boundary road and forms part of the boundary. It provides access to North Fork Squaw Creek Reservoir.

Sperry Creek WSA is shaped like a triangle, contains 5,360 acres, and is approximately three miles wide and 4 1/2 miles long. The study area is bordered on the east and south by BLM roads, on the west by private property and a BLM road, and on the north by private property and split estate.

All of the four WSAs are separated by BLM roads; also a 40-acre private parcel lies between Camp Creek and Cottonwood Creek WSAs, located at the juncture of Alder and Cottonwood Creeks. The combined shape of the four WSAs resembles an hourglass, approximately 15 miles long, six miles wide at each end and 1 1/2 miles wide in the middle. Combined acreage in the four WSAs is 45,140 acres.

All four study areas lie within the sagebrush steppe ecological zone, a semiarid ecosystem dominated by sagebrush-grassland plant associations.

The areas are characterized by steeply sloped canyons and lava-rimmed tablelands. The canyon bottoms support pockets of riparian vegetation. The dominant vegetation on the tablelands is low sagebrush and bluebunch wheatgrass. In the canyons it is Wyoming big sagebrush and bluebunch wheatgrass with some bitterbrush and Idaho fescue. Elevation ranges from approximately 2,700 to 5,300 feet. Average steepness of the slopes varies from 25 to 90 percent making them very difficult to traverse.

Each WSA has its own unique characteristics. The northwestern portions of the Camp Creek WSA are characterized by tableland, while the remainder contains steep canyons. Cottonwood Creek is the dominant stream in the area. Four major side canyons enter Cottonwood Creek.

Cottonwood Creek WSA is dominated by the canyons of Cottonwood Creek and Little Cottonwood Creek. The eastern half of the unit is a gently sloping upland.

The southwestern portion of Gold Creek is characterized by tableland, while the remainder contains the steep canyons of Gold Creek and the North Fork of Squaw Creek.

The southern third of Sperry Creek WSA is characterized by tableland, while the remainder contains the steep canyons of Sperry and Indian Creeks.

Interrelationships

A portion of the Gold Creek WSA along the Malheur River is part of two power site reserves, which earmark the land for potential water power and water storage development. These 'withdrawals' are scheduled for review in the next few years, which may lead to their revocation. Power site development is not foreseen, and therefore not discussed further.

The Oregon Department of Fish and Wildlife stocks the North Fork Squaw Creek Reservoir in Gold Creek WSA.

Issues

Issues relating to the WSAs were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSAs, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for these WSAs include:

- construction of proposed livestock projects in the WSAs,
- use of adjacent private property and split-estate parcels (effects of wilderness designation on private lands are addressed in the Statewide EIS volume),
- potential mineral exploration and development,
- the area's prominent canyons and perennial streams which provide important raptor habitat, critical deer and antelope winter range, and redband trout habitat.
- the existing Pacific Power and Light (PP&L) transmission line, located along the southern boundary of Cottonwood Creek and Camp Creek WSAs,
- the existing multi-use utility and transportation corridor along the Malheur River, located just outside the northern boundary of Sperry Creek and Gold Creek WSAs,

- continued vehicle use of the ways on the tableland portions of the WSAs,

- the wild horse herd in the Cottonwood Creek WSA, and construction of an access road to the wild horse trap. (The wild horse herd, which uses a portion of the Cottonwood Creek WSA, has been removed from the WSA. Therefore, wild horses would not be affected by any of the wilderness alternatives and are not discussed further in this appendix.); and

- designation of a wilderness area with an identifiable boundary.

One other issue concerned the influence of Gold Creek's and Cottonwood Creek's narrow or irregular configuration upon their suitability as wilderness.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- partial (preferred alternative for Camp Creek and Cottonwood Creek WSAs)
- no wilderness/no action (preferred alternative for Gold Creek and Sperry Creek WSAs)

An opportunity exists to close the three BLM-maintained roads (totaling 12 miles) between the WSAs and manage them as a single wilderness area. This is analyzed in the enhanced wilderness alternative. All of these roads are lightly maintained and extremely rough, barely passable routes (four-wheel drive). This is especially true for the road down Cottonwood Creek Canyon between Camp Creek WSA and Cottonwood Creek WSA which washes out each spring during high water runoff.

A partial alternative for either Gold Creek or Sperry Creek WSAs is not analyzed because there are no resource conflicts which could be eliminated or minimized by recommending portions of the areas as nonsuitable for wilderness.

All Wilderness

Under the all wilderness alternative, each of the four WSAs would be recommended suitable as wilderness and managed as separate wilderness areas: 18,360 acres in Camp Creek; 8,500 acres in Cottonwood Creek; 12,920 acres in Gold Creek; and 5,360 acres in Sperry Creek WSAs (see map 2). For purposes of analysis under this alternative, it is assumed that none of the adjacent private or split-estate land would be acquired.

The roads between the WSAs and the dead-end road into Gold Creek WSA would remain open.

Enhanced Wilderness

Under the enhanced wilderness alternative, the entire areas of all four WSAs would be combined into a single wilderness area, and a total of 45,140 acres would be recommended suitable as wilderness (see map 3). Six miles of road between Camp Creek WSA and Cottonwood Creek WSA, two miles of road between Camp Creek WSA and Gold Creek WSA, a half-mile of road into Gold Creek WSA, and four miles of road between Gold Creek WSA and Sperry Creek WSA would be closed.

An attempt would be made to acquire 40 acres of private property and 680 acres of split estate adjacent to the Camp Creek WSA, 160 acres of split estate adjacent to the Cottonwood Creek WSA, 680 acres of split estate adjacent to the Gold Creek WSA and 240 acres of split estate adjacent to the Sperry Creek WSA. These parcels could be acquired through purchase or exchange with willing owners. An additional 160 acres of public land next to the Camp Creek WSA and 40 acres of public land next to the Cottonwood Creek WSA would also be included in the recommended wilderness.

Assuming acquisition of the private and split-estate lands and addition of public land, a total of 47,140 acres would be recommended suitable under this alternative.

Partial (Preferred Alternative for Camp Creek and Cottonwood Creek WSAs)

Under the partial alternative, portions of two WSAs (15,240 acres in the Camp Creek WSA and 7,700 acres in the Cottonwood Creek WSA) would be combined, and a total of 22,940 acres would be recommended suitable as wilderness (see map 4). Five miles of road between Camp Creek WSA and Cottonwood Creek WSA would be closed. An attempt would be made to acquire 680 acres of split estate in two parcels adjacent to the Camp Creek WSA, through purchase or exchange with willing owners. In addition, 160 acres of public land next to the Camp Creek WSA would be added to the recommended area.

Assuming acquisition of the split estate and addition of the public land, a total of 23,780 acres would be recommended suitable under this alternative.

A total of 3,920 acres would be recommended nonsuitable for wilderness designation (3,120 acres in the Camp Creek WSA and 800 acres in the Cottonwood Creek WSA).

The boundary would exclude the tableland in the northwest portion of the Camp Creek WSA, the two forks of Cherry Creek, and the tableland in the eastern portion of the Cottonwood Creek WSA. Any opportunity to combine Gold Creek and Sperry Creek WSAs with the recommended area under this alternative would be eliminated with the exclusion of the tableland in the northwest portion of the Camp Creek WSA.

No Wilderness/No Action (Preferred Alternative for the Gold Creek and Sperry Creek WSA)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development,
- continued restriction of vehicles to existing routes,
- construction of livestock projects, including four stock water reservoirs in Camp Creek WSA, two stock water reservoirs in the Gold Creek WSA and three spring developments in the Sperry Creek WSA.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Table 1. Summary of Proposed Management Under Each Alternative, Camp Creek (OR-3-31), Cottonwood Creek (OR-3-32), Gold Creek (OR-3-33), and Sperry Creek (OR-3-35) WSAs

Proposed Management	All Wilderness	Enhanced Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	45,340	45,340	23,100	0
Acres Closed to ORVs by Wilderness Designation	45,140	45,140	22,940	0
Miles of Roads Closed	0	12.5	5.0	0
Miles of Ways Closed	13.0	13.0	8.0	0
Acres of Full Fee Estate Acquired [1]	0	40	0	0
Acres of Split Estate Acquired [1]	0	1,760	680	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	45,140	45,340	23,100	0
Structural Livestock Projects Developed:				
Reservoirs & Waterholes (number)	0-6	0-6	4-6	6
Springs (number)	0-3	0-3	3	3

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Manageability of the Area as Wilderness

All of the alternatives would be manageable as wilderness. However, certain manageability problems would exist. Under the all wilderness alternative, it would be difficult to preserve the areas' wilderness characteristics if mineral development occurred on the split-estate parcels adjacent to each of the WSAs. Potentially, this could add substantial outside sights and sounds which would adversely affect the areas' wilderness character.

The individual size and shape of Cottonwood Creek, Gold Creek and Sperry Creek could make management of these areas as separate wilderness areas difficult. They have small, narrow or irregular configurations which would make it difficult to manage them for solitude or primitive recreation, and which would allow outside sights and sounds to adversely affect the areas' wilderness character.

The enhanced wilderness alternative maximizes the ability to manage the area to preserve its wilderness character. The road closures, acquisitions and combination of the four areas would:

Table 2. Summary of Environmental Consequences of Alternatives, Camp Creek (OR-3-31), Cottonwood Creek (OR-3-32), Gold Creek (OR-3-33), and Sperry Creek (OR-3-35) WSAs

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Preferred for OR-3-31,3-32)	No Wilderness/No Action (Preferred for OR-3-33,3-35)
Wilderness Values	Would add all four WSAs to the NWPS as separate wilderness areas (18,360 acres in Camp Creek WSA; 12,920 acres in Gold Creek WSA; and 5,360 acres in Sperry Creek WSA). Total acreage of the four wilderness areas would be 45,140 acres. Preserves areas of steep-sloped canyons and lava-rimmed tablelands. All four areas are manageable as wilderness. Closure of 13 miles of ways would enhance wilderness values. Development of adjacent private and split-estate land could adversely affect wilderness values on adjacent public lands.	Would combine all four WSAs into a single area and add 47,140 acres to the NWPS, assuming acquisition of private and split-estate land and addition of public land. Closure of 13 miles of ways and 12½ miles of roads would enhance wilderness values. Acquisition of 2,000 acres adjacent to the WSAs would prevent developments which could impair wilderness values on adjacent public lands. Area recommended suitable would be manageable as wilderness.	Would combine portions of Camp and Cottonwood Creek WSAs and add 23,780 acres to the NWPS, assuming acquisition of split-estate lands and addition of public land. Closure of 8 miles of ways and 5 miles of roads would enhance wilderness values, and acquisition of split-estate lands would prevent developments which could impair wilderness values on adjacent public lands. Wilderness characteristics on 3,920 acres of Camp and Cottonwood Creek WSAs and all of Gold and Sperry Creek WSAs would be subject to adverse impacts from possible mining, motorized vehicles, and expansion of the utility corridor into Camp and Cottonwood Creek WSAs. The area recommended suitable would be manageable as wilderness.	All four WSAs' wilderness characteristics would be subject to impacts from continued motorized use, possible mining and expansion of utility corridor into Camp and Cottonwood Creek WSAs.
Energy and Mineral Development	Development precluded on 18,360 acres in Camp Creek; 8,500 acres in Cottonwood Creek; 12,920 acres in Gold Creek; and 5,360 acres in Sperry Creek WSAs. Includes areas with moderate potential for metals, oil and gas, bentonite, perlite, and optical calcite, which encompass all four WSAs, except no moderate potential metals or optical calcite in Sperry Creek WSA. Also includes the area rated high for optical calcite, which encompasses Sperry Creek WSA only.	Development precluded on 45,140 acres, including 45,140 acres with moderate potential for oil and gas, bentonite and perlite, 39,780 acres with moderate potential for metals and optical calcite, and 5,360 acres with high potential for optical calcite.	Development precluded on 22,940 acres, including 22,940 acres with moderate potential for oil and gas, metals, bentonite, perlite, and optical calcite.	No impact.
Wildlife	Wildlife habitat preserved.	Wildlife habitat preserved. Potential bighorn habitat enhanced by closing roads. Fish, raptor and chukar habitat in Camp and Cottowood Creek WSAs enhanced by closing road along Cottonwood Creek.	Wildlife habitat preserved in suitable area. Otherwise, same as enhanced wilderness.	Livestock water developments would provide increased wildlife populations.
Livestock Grazing	Proposed projects resulting in better livestock distribution and an increase of 360 AUMs might be foregone.	Same as all wilderness.	Two proposed reservoirs in the Camp Creek WSA, three spring developments in Sperry Creek and two reservoirs in Gold Creek would be constructed, resulting in better distribution of livestock and an additional 260 AUMs. The other two reservoirs with an associated 100 AUMs in Camp Creek might be foregone.	All proposed projects would be constructed, resulting in better distribution of livestock. An additional 360 AUMs would be realized.
Utility Corridor Routing	Would not allow expansion of utility corridor north of existing PP&L powerline. No significant impact.	Same as all wilderness.	Would allow expansion of utility corridor north of existing PP&L powerline.	Would allow expansion of utility corridor north of existing PP&L powerline.
Recreation Use	Slight decline in vehicle-oriented recreation. Development of livestock water projects, if allowed, would increase hunting and fishing use slightly. Little overall change.	Only slight decline in recreation from reduced vehicle-oriented use, partially offset by increased primitive recreation use. Development of livestock water projects would increase hunting and fishing use slightly. Overall, no change.	Only slight change in recreation from reduced vehicle-oriented recreation, offset by increased primitive recreation use. Development of livestock water projects would increase hunting and fishing use slightly.	Development of livestock water projects would increase hunting and fishing use slightly.

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Preferred for OR-3-31,3-32)	No Wilderness/No Action (Preferred for OR-3-33,3-35)
Economic Value and Local Income	Increase in economic value and local personal income by $2,578 and $7,815, respectively, if all structural projects were allowed. Decrease of $20 in economic value and no change in local personal income if no projects were allowed. The maximum increase in transportation costs to livestock operators would be $20.	Same as all wilderness.	Increase in economic value and local personal income by $2,578 and $7,815, respectively, if all structural projects were allowed. Increase in economic value and local personal income by $1,706 and $5,530, respectively, if no projects were allowed within the suitable area. The maximum increase in transportation costs to livestock operators would be $20.	Increase in economic value and local personal income by $2,598 and $7,815, respectively, from construction of all proposed projects.

- allow rehabilitation of the closed roads restoring the area to a more natural appearance,

- eliminate vehicles on the closed roads which would enhance the area's opportunities for solitude and primitive recreation,

- eliminate the potential of development and the need for access to the private and split-estate lands which would preserve the area's naturalness, and

- create a much larger area, resulting in greater distribution of wilderness visitors and enhancing the opportunity for solitude.

The partial alternative (preferred for Camp Creek and Cottonwood Creek WSAs) would enhance manageability of those areas in a manner similar to the enhanced wilderness alternative but to a lesser degree. In addition this alternative utilizes physical boundaries in certain areas which would provide for easy boundary identification and enforcement of vehicle restrictions.

Rationale for Selection of the Preferred Alternative

The partial alternative is preferred for the Camp Creek and Cottonwood Creek WSAs because the combined suitable area would offer a variety of wilderness values; the benefits of preserving those values would outweigh the benefits of retaining options for development of potential mineral and other resources.

The portion recommended suitable for wilderness offers excellent opportunities to enjoy solitude and primitive recreation in an area with a generally natural setting and many special wilderness features. Special features within the combined area include prominent canyons, deer and antelope summer and winter range, excellent raptor habitat, and redband trout. Opportunities for educational and scientific study of geology, wildlife and paleontology are excellent.

The road proposed for closure does not lead to any range projects requiring vehicle access. The road is low quality, passable only to high clearance or four-wheel drive vehicles, and used mainly by chukar and deer hunters. Ample hunting opportunities, accessible by vehicle, are available nearby.

Closing the road and combining the two areas would enhance the area's wilderness quality and manageability. It would provide a larger wilderness area in which to seek solitude and pursue unconfined primitive recreation activities. By removing vehicles from the canyon, the solitude of wilderness visitors within sight of the canyon would be increased. Primitive recreation would also be enhanced by providing an opportunity to enjoy the area's most prominent canyon without disturbance from vehicles.

Cottonwood Canyon would undoubtedly serve as the major travel corridor through the wilderness area. The area's naturalness would improve through natural rehabilitation of the road bed. There would be less disturbance of wildlife such as raptors, chukar, deer and small nongame animals. There would also be less disturbance of the riparian areas and stream banks along Cottonwood Creek which would benefit the redband trout.

Acquisition of the private land and split estate would eliminate possible adverse effects upon the area's naturalness, solitude and primitive recreation opportunities by precluding the potential for mineral development and the need for access.

Three areas containing a total of 3,920 acres would be recommended as nonsuitable for wilderness. The tableland in the northwest corner of the Camp Creek WSA would be recommended nonsuitable to allow for exploration for and development of possible mineral resources and to allow recreationists to continue to drive vehicles on the tableland and to the rim of the canyons. The area also would be recommended nonsuitable because of the anticipated difficulty in preventing continued vehicle use of ways on the tableland if the area were included in wilderness.

Excluding the two forks of Cherry Canyon in the Camp Creek WSA from wilderness designation would maintain existing vehicle access to the 40-acre private parcel at the juncture of Alder and Cottonwood Creek Canyon, provide for future access up Cottonwood Creek Canyon to private property on the boundary of the WSA, and allow for exploration for and development of possible mineral resources. The tableland in the eastern portion of Cottonwood Creek WSA has few wilderness values and would be recommended as nonsuitable to allow for exploration for and development of possible minerals resources. Locating the boundary on the rim would make it easily identifiable and would also aid in the control of vehicles.

The no wilderness/no action alternative is preferred for the Gold Creek and Sperry Creek WSAs because the two WSAs are more suitable for other uses than for wilderness and because of the potential problems of managing the area as wilderness. The Gold Creek WSA would be recommended nonsuitable because of the potential impacts upon the area's wilderness quality from possible development of the split-estate parcel (640 acres) adjacent to and almost surrounded by the WSA in Gold Creek Canyon, and because of the potential for mineral development in the area. Exclusion of the 1-mile section of split estate in the canyon results in a very poor configuration and would eliminate a portion of the area that contributes significantly to the outstanding solitude and primitive recreation opportunities, as well as several special wilderness features. Because of the split estate, the WSA has a shape which limits the area's wilderness values.

Development of minerals on the split estate would require access up the canyon, resulting in significant impacts to wilderness values. In view of the potential for mineral development on the split estate, the moderate potential for the occurrence of gold, silver and mercury in the WSA, and the effect of the area's narrow configuration on wilderness values and manageability as wilderness, the benefits of keeping the area open to potential mineral development would outweigh the benefits of preserving the area's wilderness values.

The no wilderness/no action alternative is preferred for the Sperry Creek WSA because the benefits of maintaining options for development of range projects without the constraints that would exist in a wilderness area, and the benefits of maintaining options for exploration of mineral resources would outweigh the benefits of preserving the area's wilderness values. The area has a limited number of special wilderness features, offers a limited number of outstanding opportunities for primitive recreation, and is relatively small. Three livestock water developments are proposed for the WSA.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

All four of the WSAs are in a highly natural condition, containing only a few, substantially unnoticeable signs of man. The rugged terrain has limited the number of man-made features in each of the WSAs. Most of the developments are located near the boundary roads and are substantially unnoticeable because of topographic screening or their small size.

A total of 50 man-made features in the four WSAs influence approximately 7 percent of the combined area. (The area of influence is an estimate of the acreage within the WSA from which the features can be seen.) Table 3 lists the man-made features in each WSA and the area influenced by these developments.

All of the water developments are substantially unnoticeable because they are small and topographically screened. However, the reservoirs located on the flatter tableland are more noticeable.

The ways consist of two tracks with a strip of grass in the center. Most of them are revegetating

Table 3. Interior Man-Made Features that Influence the WSAs, Camp Creek (OR-3-31), Cottonwood Creek (OR-3-32), Gold Creek (OR-3-33), and Sperry Creek (OR-3-35) WSAs

Feature	Camp Creek	Cottonwood Creek	Gold Creek	Sperry Creek	Total All Four WSAs
Fences (miles)	4 (1)	2 (2)	1 (3)	4 (7)	11 (13)
Water Developments	8	6	6	1	21
Ways (miles)	7 (7)	3 (1)	6 (3)	2 (2)	18 (13)
Total developments	19	11	13	7	50
Percent of WSA Influenced	4	4	9	16	7

naturally from lack of use.

The most noticeable outside sights and sounds include the boundary roads, a PP&L powerline, which influences the extreme southern portion of Cottonwood Creek and Camp Creek WSAs; and the Malheur River Canyon, which includes Highway 20, railroad tracks, powerlines, ranch developments, pastures, fences and dirt roads that influence the northern slopes of the Gold Creek and Sperry Creek WSAs. None of these outside sights and sounds are significant enough to diminish the benefits of wilderness designation.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

All of the WSAs offer outstanding opportunities for solitude and primitive and unconfined types of recreation. Opportunities for solitude are outstanding primarily because of the areas' diverse topography. The area contains over 50 miles of major drainages and numerous side drainages. However, the areas' rugged topography limits the area available for hiking to the tableland or canyon bottoms. Travel from canyon bottoms to the tableland is generally limited to breaks in the rimrock where game and livestock trails provide access.

The tablelands in the western portion of the Camp Creek WSA and the southern portions of the Gold Creek and Sperry WSAs and the gentle slopes in the eastern portion of the Cottonwood Creek WSA have minimal relief and provide little topographical screening. In addition, the relatively narrow configuration of the Cottonwood Creek WSA would limit the opportunities for finding solitude by concentrating visitors.

Vegetative screening in the WSAs is limited primarily to a minor amount of screening from riparian vegetation in the bottom of the canyons.

Table 4 identifies outstanding primitive recreation opportunities in each WSA. The Camp Creek WSA offers the largest number of outstanding opportunities for primitive recreation because of its larger size and greater diversity.

Because the tablelands lack unique or diverse attractions, most visitor use would occur within the major canyons of Cottonwood Creek, Little Cottonwood Creek, Camp Creek, Wildcat Creek, Tims Creek, North Fork Squaw Creek, Gold Creek, Sperry Creek and Indian Creek. Major access points would probably be at the north end of Cottonwood Creek near the Stringer shearing plant and at the mouth of Gold Creek off Highway 20.

Special Features

All of the WSAs provide an outstanding example of rugged canyonlands. These impressive canyons dominate the landscape and are of special geologic interest.

The Camp and Cottonwood Creek WSAs contain outstanding raptor habitat and potential bighorn sheep habitat.

Portions of Cottonwood Creek, Camp Creek and North Fork of Squaw Creek are a cold water fishery for redband trout, a native fish with limited range.

Table 4. Outstanding Primitive Recreation Opportunities, Camp Creek (OR-3-31), Cottonwood Creek (OR-3-32), Gold Creek (OR-3-33), and Sperry Creek (OR-3-35) WSAs

Primitive Recreation Opportunity	**Camp Creek** WSA	**Cottonwood** Creek WSA	**Gold Creek** WSA	**Sperry Creek** WSA
Day hiking	X	X	X	
Backpacking	X			
Camping	X			
Hunting	X	X	X	X
Sightseeing	X	X	X	X
Photography	X	X	X	X
Bird Watching	X		X	
Horseback Riding	X	X	X	

- (X denotes opportunity available)

The northern halves of Gold Creek and Sperry Creek are critical winter range for mule deer.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, all of the WSAs are located in the Intermountain Sagebrush Province and have the potential natural vegetation of a sagebrush steppe. Of the major vegetative communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, the WSAs contain big sagebrush/bluebunch wheatgrass and low sagebrush/bluebunch wheatgrass communities.

There are two standard metropolitan statistical areas with populations over 100,000 within five hours' driving time of the WSAs: Boise, Idaho, and Kennewick/Richland/Pasco, Washington.

Energy and Mineral Development

Energy and mineral resources of the four WSAs were evaluated by TERRADATA, under a BLM contract, based upon general geologic data supplemented by limited sampling of geochemical stream sediments. Technical details of the evaluation are in the TERRADATA report titled "Assessment of Geology, Energy, Mineral Resources of Lake Owyhee Geologic Resource Area (GRA)." This report was supplemented with additional information such as leases and general mineral resources, and heavy minerals geochemical data from Barringer Resources, Inc., in September 1984.

The WSAs are within the Lake Owyhee geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The area contains geologic environments with different degrees of favorability for the occurrence of energy and mineral resources. The Camp Creek and Cottonwood Creek WSAs have moderate favorability for gold, silver, mercury, oil and gas, optical calcite, perlite and bentonite.

The entire Gold Creek WSA is moderately favorable for gold, silver, oil and gas, bentonite, optical calcite and perlite. A portion is moderately favorable for mercury.

Silver and mercury are strategic and critical minerals; however, there are no known deposits of strategic and critical minerals in any of the WSAs.

The Sperry Creek WSA is moderately favorable for oil and gas, bentonite and perlite and highly favorable for optical calcite.

Details of the mineral potential rating are shown in Table 5.

There were no mining claims and no oil and gas or

Table 5. Classification of Energy and Mineral Potential, Camp Creek (OR-3-31), Cottonwood Creek (OR-3-32), Gold Creek (OR-3-33), and Sperry Creek OR-3-35) WSAs

Commodity	Area	Classification Level	Confidence Level
Metals			
gold	Part of 3-31, 3-32, 3-33 [1]	3	B
mercury, gold, silver	Rest of 3-31, 3-32, 3-33 [1]	3	A
	3-35	2	B
Geothermal	Entire area (all WSAs)	1	B
Uranium/thorium	Entire area (all WSAs)	1	B
Coal	3-31, 3-32, 3-33	1	C
	3-35	1	B
Oil/gas	Entire area (all WSAs)	3	B
Tar sands/oil shale	Entire area (all WSAs)	1	C
Limestone	3-31, 3-32, 3-33	1	B
	3-35	1	C
Bentonite	3-31, 3-32, 3-33	3	A
	3-35	3	B
Perlite	3-31, 3-32, 3-33	3	B
	3-35	3	C
Zeolites	3-31, 3-32, 3-33	2	C
	3-35	2	B
Optical Calcite	3-31, 3-32, 3-33	3	C
	3-35	4	C

[1] See map 5

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Lesel D - Abundant direct and indirect evidence

geothermal leases in any of the WSAs as of January 1, 1984.

The rocks exposed in all of the WSAs are Tertiary. These rocks comprise a thick sequence of volcanogenic rocks that range from rhyolitic flows and flow breccias, basaltic to minor andesitic composition. Mesozoic and Paleozoic marine sedimentary rocks may occur at undetermined depths in the study area.

Vegetation

Vegetation throughout all four of the WSAs is characteristic of a sagebrush steppe ecosystem. The ecological successional stage in all the WSAs is predominantly late seral, except in the vicinity of Sperry Creek and Indian Creek in the Sperry Creek WSA where it is mid-seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) In addition, small portions of all of the areas are in climax because of rugged terrain and inaccessibility to livestock.

The climax vegetation throughout most of the WSAs would be a bluebunch wheatgrass/Wyoming big sagebrush association. The climax vegetation in the tableland area would be a bluebunch wheatgrass sagebrush association. Numerous pockets of riparian vegetation are scattered throughout the canyon bottoms.

Wildlife

The Camp Creek and Cottonwood Creek WSAs supply good quality habitat for mule deer and antelope. Deer use is relatively light and scattered during the spring and fall. Herds from adjoining summer ranges concentrate in the study areas during normal winters and comprise one of several major wintering areas in northern Malheur County. Severe winters push many deer out of the area north into the breaks of the Malheur River Canyon, which includes the northern portions of Gold and Sperry Creek WSAs. These areas have been classified as crucial winter range. A small number of antelope use all four WSAs year round.

Upland game birds common in the study areas include California quail and chukar. Their numbers and distribution are typical of some of the better suitable habitat in the county. Malheur County is a major upland game bird producer in the state.

Cottonwood Creek, Camp Creek and the North Fork of Squaw Creek are cold water fisheries which support a sustaining native population of redband trout. This species is considered sensitive in the state and long-term stream improvement work is targeted for this species. A road up Cottonwood Creek Canyon reduces the quality of fish habitat where it crosses or follows the stream bed.

The high cliffs and rock formations, which dominate much of the Camp Creek and Cottonwood Creek WSAs, provide outstanding habitat for raptors and other cliff dwelling birds. Raptors attracted to the area include golden eagles, prairie falcons, turkey vultures, kestrels, red tailed hawks, and great horned owls. These raptors use the area during the summer and fall before migrating to other areas. Rock doves and kingfishers occur along Cottonwood Creek.

Wildlife populations (especially raptors and chukar) in Cottonwood Creek Canyon are below potential due to vehicular traffic and hunting along the boundary road between Cottonwood Creek and Camp Creek WSAs.

Long term planning documents recognize Camp Creek and Cottonwood Creek WSAs as suitable for reintroduction of California bighorn sheep. Quality perennial grass forage, inaccessibility to motorized vehicles and relatively good water sources are identified as key factors which make the area a good prospect for sheep reintroduction.

Nongame wildlife is comprised of common and widespread species endemic to eastern Oregon.

Livestock Grazing

Portions of one grazing allotment are within Camp Creek, Cottonwood Creek, and Gold Creek WSAs, and a portion of another allotment is within Sperry Creek WSA. Table 6 summarizes existing and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Existing livestock projects include the fences and water developments listed in table 3.

Livestock projects are proposed in three WSAs, which would better distribute livestock and result in a potential increase in AUMs: four stock water reservoirs in the Camp Creek WSA, with a resulting potential increase of 200 AUMs in the WSA; two stock water reservoirs in the Gold Creek WSA, with a resulting potential increase of 100 AUMs in the WSA; and three springs in the Sperry Creek WSA with a potential increase of 60 AUMs in the WSA.

Livestock operators use vehicles to distribute salt and to check livestock on the periphery of the WSAs. Horses are used to check livestock inside the WSAs and to move livestock to and from the area.

Utility Corridor Routing

The Malheur River Canyon from Harper to Juntura is a designated multiple use utility/transportation corridor. The corridor, which forms a portion of the northern boundaries of the Gold Creek and Sperry Creek WSAs, contains U.S. Highway 20, railroad tracks, a 69-kV power transmission line, and a telephone line. Idaho Power Company proposes upgrading the powerline to 138-kV within 10 years. The proposed upgrading would use the existing right-of-way and would not require new towers. There are no plans to upgrade the highway, railroad tracks or telephone line.

The existing Pacific Power and Light 500-kV powerline passes within approximately 600 feet of the extreme southern portion of the Camp Creek and Cottonwood Creek WSAs. The Northern Malheur management framework plan (MFP) proposes to designate a 2-mile-wide utility corridor following the same route as the existing powerline, to allow construction of additional lines. However, it can not be designated until Congress has enacted legislation for all of the WSAs along the proposed route. The corridor could only be designated in locations that would be compatible with such legislation.

Table 6. Existing and Potential Livestock Use, Camp Creek (OR-3-31), Cottonwood Creek (OR-3-32), Gold Creek (OR-3-33), and Sperry Creek (OR-3-35) WSAs

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Camp Creek WSA					
Harper (No. 0301)	12,903	Mar-Oct	14	2,146	200
Cottonwood Creek WSA					
Harper (No. 0301)	12,903	Mar-Oct	6	707	0
Gold Creek WSA					
Harper (No. 0301)	12,903	Mar-Oct	9	1,964	100
Sperry Creek WSA					
Jonesboro (No. 0305)	2,661	Apr-June	28	849	60
Totals				5,666	360

[1] Increase might or might not result in increased licensed use in the alloment (see narrative).

Recreation Use

Although the WSAs offer excellent opportunities for several recreational activities, they currently receive very little recreational use except for a moderate amount of hunting use. Deer, antelope, quail, and chukar are all hunted in this area. Hunters mainly use the boundary roads for access along the periphery of the WSAs. Ease of hunter movement and shooting opportunities are limited by the terrain; however, these factors are offset by the number of animals present.

Except for North Fork Squaw Creek Reservoir, the WSAs receive very little recreational use by fishermen because of the limited number of available fish in the perennial streams.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in the WSAs. As of January 1, 1984, there were no oil and gas leases or geothermal leases in the combined area.

Economic value and local personal income generated from existing levels of resource outputs for the combined area and for individual WSAs are presented in table 7. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Table 7. Economic Value and Local Personal Income Generated Annually, Existing Program, WSAs OR-3-31, 3-32, 3-33, 3-35 (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
COMBINED AREA				
Grazing	AUM	5,666	$42,721	$91,109
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Camp Creek WSA				
Grazing	AUM	2,146	$16,181	$34,508
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Cottonwood Creek WSA				
Grazing	AUM	707	$5,331	$11,369
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Gold Creek WSA				
Grazing	AUM	1,964	$14,809	$31,581
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Sperry Creek WSA				
Grazing	AUM	849	$6,401	$13,652
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add four individual areas totaling 45,140 acres (18,360 acres in Camp Creek WSA; 8,500 acres in Cottonwood Creek WSA; 12,920 acres in Gold Creek WSA; and 5,360 acres in Sperry Creek WSA), to the National Wilderness Preservation System (NWPS). It would preserve areas of steeply sloped canyons and lava-rimmed tablelands, containing special wilderness features and outstanding opportunities for solitude and primitive recreation in a generally natural setting.

This alternative would preserve the rugged scenic canyons, habitat for mule deer, antelope, upland game birds and redband trout, and opportunities for primitive recreation. The naturalness of each WSA would be improved by the closure of 13 miles of ways resulting in natural revegetation (7 miles in Camp Creek, 1 mile in Cottonwood Creek, 3 miles in Gold Creek, and 2 miles in Sperry Creek).

Restrictions on erosion-causing activities, such as mineral exploration and development, would provide watershed protection and preserve habitats for fish and other aquatic wildlife.

If minerals were developed on the split-estate land in the center of the Gold Creek WSA, wilderness values on the surrounding public lands would be impaired.

The **enhanced wilderness alternative** would add 47,140 acres to the NWPS, assuming 1,800 acres of private and split-estate land could be acquired and 200 acres of public land added to the area.

Combining the WSAs and closing the three roads between them eliminates the problems related to the relatively small size and poor configuration in the Cottonwood Creek and Sperry Creek WSAs. Adverse effects of these three boundary roads on the area's naturalness and opportunities for solitude and primitive recreation would be eliminated.

Acquisition of the 40-acre private parcel and the 1,760 acres of split estate would eliminate the possibility that development and construction of access to the lands would adversely affect the area's naturalness and opportunities for primitive recreation and solitude. Of the four split-estate parcels, acquisition of the parcel located in Gold Creek Canyon WSA would contribute the most to averting possible adverse effects on the areas' wilderness characteristics.

Outstanding primitive recreation opportunities in the combined area would include sightseeing, photography, hiking, camping, backpacking, hunting, bird watching and horseback riding. The combined area's abundant topographic screening, numerous travel corridors, and relatively large size would provide more opportunities for solitude than would each of the individual WSAs. The combined area's recreation opportunities would also be more diverse than those in each of the individual WSAs.

Combining the areas would also enhance opportunities for solitude and primitive recreation by allowing greater dispersion of visitors. However, the area would consist of two large portions connected by a 1.5-mile wide isthmus, which is flat with minimal topographical and vegetative screening. Users traveling from one portion to the other would be channeled through the isthmus, and groups of visitors would be visible to each other.

Closure of 13 miles of ways would have the same effect as under the all wilderness alternative. Closure of 12 1/2 miles of road would further enhance wilderness values.

The **partial alternative** would add 23,780 acres to the NWPS, assuming acquisition of 680 acres of split-estate land and addition of 160 acres of public land. Five miles of the boundary road between Camp Creek and Cottonwood Creek WSAs would be closed and portions of the two areas combined into a single wilderness area.

Combining the two WSAs and closing the road segment between them would eliminate the problems related to the relatively small size and narrow width of the Cottonwood Creek WSA.

Closure of 8 miles of ways and 5 miles of roads would enhance the area's naturalness and improve opportunities for solitude and primitive recreation.

Acquisition of two parcels (680 acres) of split estate adjacent to the Camp Creek WSA would eliminate the possibility that mineral development on the split-estate woudl adversely affect the area's naturalness and opportunities for primitive recreation and solitude.

Opportunities for primitive recreation and solitude in the Cottonwood Creek and Camp Creek WSAs under the partial alternative would be similar to those under the enhanced wilderness alternative except there would be a smaller area for people to use and fewer travel corridors.

Much of the critical deer and antelope winter range and some prominent canyons in Gold and Sperry Creek WSAs would not be included in this alternative. Otherwise the impacts upon the area's special features would be similar to the enhanced wilderness alternative.

On the 3,920 acres recommended nonsuitable, naturalness and opportunities for solitude and primitive recreation would be subject to continued adverse effects from vehicles on the existing ways, development of access to the private property on Cottonwood Creek (Gugle Place), possible exploration and development of mineral resources, possible powerline construction in the utility corridor proposed within the southern edge of the area, and development of two stock water reservoirs. Special wilderness features in the nonsuitable area would not be significantly affected unless the incompatible activities, such as mining, were major.

The **no wilderness/no action alternative** would not preserve any of the four areas' wilderness characteristics. Naturalness, opportunities for solitude and primitive recreation, and special wilderness features would be subject to adverse impacts from motorized vehicles, mineral exploration and development, construction of livestock projects and possible powerline construction in the utility corridor proposed within the southern edge of the area. Natural processes would not be allowed to operate freely.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from exploration and development. The acres withdrawn under each alternative, including the acres of land classified as having moderate or high mineral potential are shown in table 8.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

If the proposed spring developments and livestock water reservoirs are developed under the **all wilderness, enhanced wilderness, or partial alternatives**, wildlife distribution could expand into new areas due to these additional water sources. This is especially true for upland game and small nongame animals. This would result in increased wildlife populations. The reservoirs may also provide fish habitat.

Under the enhanced wilderness and partial alternatives, there may be a slight decrease in upland game bird harvest along Cottonwood Creek due to the road closure. This would result in less disturbance to these birds and a possible increase in populations.

Under the enhanced wilderness alternative, potential bighorn sheep habitat would be enhanced through the creation of a larger roadless area with less disturbance to the sheep. This also applies, to a lesser extent, to the partial alternative since the primary sheep habitat is around Cottonwood Creek Canyon and its tributaries.

The stream quality of Cottonwood Creek and its riparian habitat would be improved in both the enhanced wilderness and partial alternatives with the closure of the road up Cottonwood Creek Canyon. There are numerous stream crossings and in many places the road actually follows the stream bed. Raptor and chukar populations would increase in Cottonwood Creek Canyon due to the road closure and reduction of hunting pressure.

Under the **no wilderness/no action alternative**, the proposed spring developments and water reservoirs for livestock would be constructed resulting in supplemental water for wildlife and an increase in populations.

Effects on Livestock Grazing

Under all alternatives, livestock grazing would remain at or near existing levels.

Under the **all and enhanced wilderness alternatives**, the six proposed livestock reservoirs and three spring developments might or might not be constructed depending on a site-specific analysis of whether they would conform with Wilderness Management Policy. If the projects were not allowed, an additional 360 AUMs of livestock forage could be foregone in the allotment.

The four reservoirs proposed for Camp Creek and

Table 8. Effects of Alternatives on Energy and Mineral Development, Camp Creek (OR-3-31), Cottonwood Creek (OR-3-32), Gold Creek (OR-3-33) and Sperry Creek (OR-3-35) WSAs

	Acres Withdrawn						
	All Wilderness				Enhanced Wilderness (4 WSAs combined)	Partial (parts of 2 WSAs combined)	No Wilderness/No Action (all 4 WSAs)
	Camp Creek	Cottonwood Creek	Gold Creek	Sperry Creek			
Total acres	18,360	8,500	12,920	5,360	45,140[1]	22,940[2]	0
Metals rated moderate	18,360	8,500	12,920	0	39,780	22,940	0
Oil and gas rated moderate	18,360	8,500	12,920	5,360	45,140	22,940	0
Bentonite rated moderate	18,360	8,500	12,920	5,360	45,140	22,940	0
Perlite rated moderate	18,360	8,500	12,920	5,360	45,140	22,940	0
Optical Calcite rated moderate	18,360	8,500	12,920	0	39,780	22,940	0
Optical Calcite rated high	0	0	0	5,360	5,360	0	0

[1] Development would also be precluded on an additional 2,000 acres if split-estate and private land is acquired and additional public land included.
[2] Development precluded on an additional 840 acres if split-estate is acquired and additional public land included.

the two reservoirs proposed for Gold Creek WSAs have benefit/cost ratios greater than 1:1. The three spring developments proposed for Sperry Creek have a benefit/cost ratio less than 1:1.

Under the **partial alternative**, the three spring developments in Sperry Creek WSA, two reservoirs in Gold Creek WSA, and two reservoirs in the Camp Creek WSA would be constructed. There would be a shift in livestock distribution into the areas around these additional water sources. The other 2 reservoirs in Camp Creek might or might not be constructed depending on a site-specific analysis of whether they would conform with Wilderness Management Policy. Under this alternative, 260 additional AUMs would be realized and 100 AUMs could be foregone in the allotment.

Under the **no wilderness/no action alternative**, all six reservoirs and three spring developments would be constructed increasing available forage by 360 AUMs in the allotment. Livestock distribution would shift into the areas around these additional water sources.

Under all the alternatives except no wilderness/no action, use of vehicles on the ways to place salt and check livestock would be prohibited unless there were no practical alternative. All of the ways and roads in the nonsuitable portion of the partial alternative and no wilderness/no action alternative would continue to be used without wilderness constraints.

Effects on Utility Corridor Routing

Under the **all and enhanced wilderness alternatives**, the proposed utility corridor would have little or no space for expansion to the north of the existing PP&L powerline. The Bonneville Power Administration, one of the proponents of this corridor, has indicated this is not a significant problem since the corridor could be expanded to the south of the existing line.

The **partial and no wilderness/no action alternatives** would accommodate an expansion of the identified corridor to the north as proposed.

Effects on Recreation Use

Under the **all wilderness alternative**, closure of the ways would limit vehicle access, mostly in the Camp Creek WSA where there are more ways. The other WSAs are so rugged and inaccessible that most recreational use is on foot and would not be affected by this alternative. A slight increase in hunting and fishing use would occur if the livestock water projects are developed. However, there would be little change in the amount or type of recreational use in the four areas.

Under the **enhanced wilderness alternative**, the additional road closures would make the combined area more inaccessible to vehicles than under all wilderness. Vehicle-oriented recreational use would decrease. This would be especially true in Cottonwood Creek Canyon. However, this would be partially offset by those individuals attracted to the enhanced day hiking, backpacking and camping opportunities in Cottonwood Canyon as a result of the road closure. Overall hunting of game birds would probably decrease. However, the quality of the hunt would probably improve for those willing to enter the area on foot or horseback. If the livestock water projects are developed, a slight increase in hunting and fishing would occur in those areas. Little change in recreational use is expected in the Gold and Sperry Creek portions of the combined area. Overall recreation use would remain about the same or decrease slightly.

Under the **partial alternative**, the effects of closing the road in Cottonwood Canyon would be the same as under the enhanced wilderness alternative. The existing ways in the nonsuitable tablelands would continue to be available for vehicle use. Hunting and fishing use would increase slightly from development of livestock water projects. Any change in recreation use under this alternative would be similar to the enhanced wilderness alternative for Cottonwood Creek Canyon. There would be very little change in recreation use under this alternative for the Gold Creek, Camp Creek, and Sperry Creek WSAs. Recreation use is not expected to change overall under this alternative.

Under the **no wilderness/no action alternative**, present recreation use would continue, except a slight increase in hunting and fishing from development of livestock water projects would occur.

Effects on Economic Value and Local Income

The economic effects of the alternatives for the combined area and for the individual WSAs are presented in tables 9a-d and 10a-d. (There are no economically significant changes in resource outputs expected for the Cottonwood Creek WSA.) Tables 9a-d show the effects on economic value and tables 10a-d, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the reservoirs and springs proposed for this area, would be constructed if the area were designated wilderness.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements and/or grazing operator access were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness, enhanced wilderness, and partial alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the consolidated area would be an increase in cost of about $20 per year.

Table 9a. Effects of Alternatives on Annual Economic Value, WSAs OR-3-31, 3-33, 3-35 Combined (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing: Investment [1]	AUM	0 to +360	+260 to +360	+360
Big Game Hunting [2]	RVD	0 to +150	+100 to +150	+150
Upland Game Hunting [2]	RVD	0 to +30	+20 to +30	+30
Fishing [2]	RVD	0 to +30	+20 to +30	+30
VALUE OF PLANNED INVESTMENTS [3]				
Grazing	$	0 to +2,714	+1,960 to +2,714	+2,714
Big Game Hunting	$	0 to +2,127	+1,418 to +2,127	+2,127
Upland Game Hunting	$	0 to +324	+216 to +324	+324
Fishing	$	0 to +213	+142 to +213	+213
Total		0 to +5,378	+3,736 t0 +5,378	+5,378
Investments [4]	$	0 to -2,780	-2,010 to -2,780	-2,780
Net Economic Value	$	0 to +2,598	+1,726 to +2,598	+2,598
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access[5]	$	-20	-20	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-20 to +2,578	+1,706 to +2,578	+2,598

[1] Expected future increases due to range improvement investments.
[2] Expected future increases from proposed livestock projects.
[3] Structural projects involving up to $34,500 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9b. Effects of Alternatives on Annual Economic Value, Camp Creek WSA (OR-3-31) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +200	+100 to +200	+200
Big Game Hunting [2]	RVD	0 to +100	+50 to +100	+100
Upland Game Hunting [2]	RVD	0 to +20	+10 to +20	+20
Fishing [2]	RVD	0 to +20	+10 to +20	+20
VALUE OF PLANNED INVESTMENTS [3]				
Grazing	$	0 to +1,508	+754 to +1,508	+1,508
Big Game Hunting	$	0 to +1,418	+709 to +1,418	+1,418
Upland Game Hunting	$	0 to +216	+108 to +216	+216
Fishing	$	0 to +142	+71 to +142	+142
Total		0 to +3,284	+1,642 to +3,284	+3,284
Investments [4]	$	0 to -1,547	+ -773 to -1,547	-1,547
Net Economic Value	$	0 to +1,737	+869 to +1,737	+1,737
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access [5]	$	-15	-15	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-15 to +1,722	+854 to +1,722	+1,737

[1] Expected future increases due to range improvement investments.

[2] Expected future increases from proposed livestock projects.

[3] Structural projects involving up to $19,200 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9c. Effects of Alternatives on Annual Economic Value, Gold Creek WSA (OR-3-33) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment[1]	AUM	0 to + 100	+100
Big game hunting [2]	RVD	0 to +50	+50
Upland game hunting [2]	RVD	0 to +10	+10
Fishing [2]	RVD	0 to +10	+10
VALUE OF PLANNED INVESTMENTS [3]			
Grazing	$	0 to +754	+754
Big game hunting	$	0 to +709	+709
Upland game hunting	$	0 to +108	+108
Fishing	$	0 to +71	+71
Total [4]	$	0 to +1,642	+1,642
Investments [5]	$	0 to -773	-773
Net Economic Value	$	0 to +869	+869
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Reduced access [6]	$	-7	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-7 to +862	+869

[1] Expected future increases due to range improvement investments.
[2] Expected future increases from proposed livestock projects.
[3] Structural projects involving up to $9,600 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Detail may not sum to "Total" due to rounding.
[5] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[6] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9d. Effects of Alternatives on Annual Economic Value, Sperry Creek WSA (OR-3-35) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +60	+60
VALUE OF PLANNED INVESTMENTS [2]			
Grazing	$	0 to +452	+452
Investments [3]	$	0 to -459	-459
Net Economic Value [4]	$	-7 to 0	-7
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-7 to 0	-7

[1] Expected future increases due to range improvement investments.
[2] Structural projects involving up to $5,700 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[4] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

Table 10a. Effects of Alternatives on Local Personal Income, WSAs OR-3-31, 3-32, 3-33, 3-35 Combined (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +360	+260 to +360	+360
Big Game Hunting [2]	RVD	0 to +150	+100 to +150	+150
Upland Game Hunting [2]	RVD	0 to +30	+20 to +30	+30
Fishing [2]	RVD	0 to +30	+20 to +30	+30
INCOME FROM PROPOSED INVESTMENTS [3]				
Grazing	$	0 to +5,789	+4,180 to +5,789	+5,789
Big Game Hunting	$	0 to +1,274	+849 to +1,274	+1,274
Upland Game Hunting	$	0 to +398	+265 to +398	+398
Fishing	$	0 to +354	+236 to +354	+354
Construction activity [4]	$	0 to +4,750	+3,430 to +4,750	+4,750
Total [5]	$	0 to +7,815	+5,530 to +7,815	+7,815
INCOME FROM ALL OUTPUT CHANGES				
All categories [5]	$	0 to +7,815	+5,530 to +7,815	+7,815

[1] Expected future increases due to range improvement investments.
[2] Expected future increases from proposed livestock projects.
[3] Structural projects involving up to $34,500 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing activity because it is not sustained over the analysis period.
[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

Table 10b. Effects of Alternatives on Local Personal Income, Camp Creek WSA (OR-3-31) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +200	+100 to +200	+200
Big Game Hunting [2]	RVD	0 to +100	+50 to +100	+100
Upland Game Hunting [2]	RVD	0 to +20	+10 to +20	+20
Fishing [2]	RVD	0 to +20	+10 to +20	+20
INCOME FROM PROPOSED INVESTMENTS [3]				
Grazing	$	0 to +3,216	+1,608 to +3,216	+3,216
Big Game Hunting	$	0 to +849	+424 to +849	+849
Upland Game Hunting	$	0 to +265	+133 to +265	+265
Fishing	$	0 to +236	+118 to +236	+236
Construction activity [4]	$	+661 to +2,642	+1,321 to +2,642	+2,642
Total [5]	$	0 to +4,566	+2,283 to +4,566	+4,566
INCOME FROM ALL OUTPUT CHANGES				
All categories [5]	$	0 to +4,566	+2,283 to +4,566	+4,566

[1] Expected future increases due to range improvement investments.
[2] Expected future increases from proposed livestock projects.
[3] Structural projects involving up to $19,200 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and activity because it is not sustained over the analysis period.
[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

Table 10c. Effects of Alternatives on Local Personal Income, Gold Creek WSA (OR-3-33) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +100	+100
Big game hunting [2]	RVD	0 to +50	+50
Upland game hunting [2]	RVD	0 to +10	+10
Fishing [2]	RVD	0 to +10	+10
INCOME FROM PROPOSED INVESTMENTS [3]			
Grazing	$	0 to +1,608	+1,608
Big game hunting	$	0 to +424	+424
Upland game hunting	$	0 to +133	+133
Fishing	$	0 to +118	+118
Construction activity [4]	$	0 to +1,321	+1,321
Total [5]	$	0 to +2,283	+2,283
INCOME FROM ALL OUTPUT CHANGES			
All categories [5]	$	0 to +2,283	+2,283

[1] Expected future increases due to range improvement investments.

[2] Expected future increases from proposed livestock projects.

[3] Structural projects involving up to $9,600 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

Table 10d. Effects of Alternatives on Local Personal Income, Sperry Creek WSA (OR-3-35) (1981 price levels)

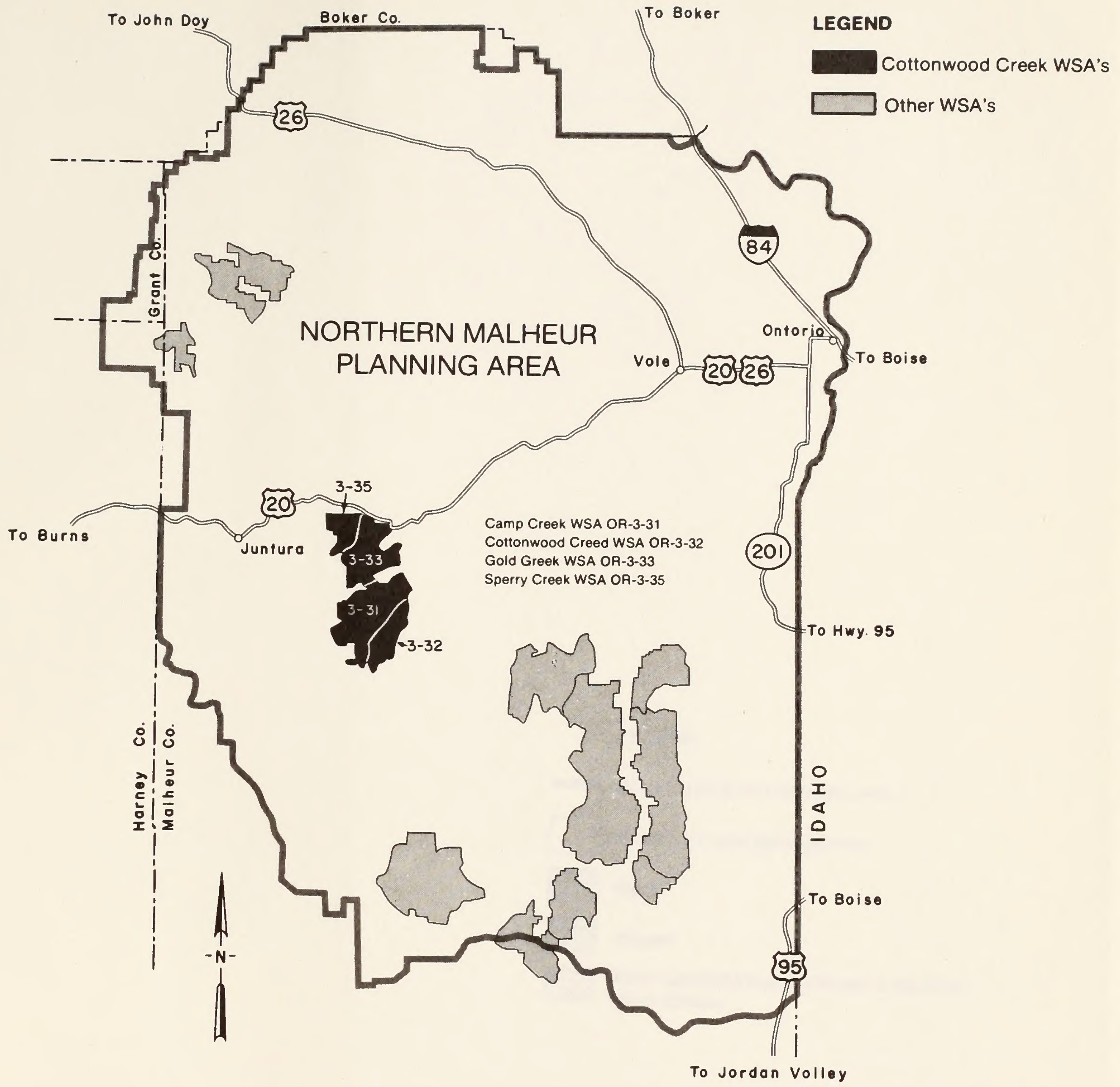
Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +60	+60
INCOME FROM PROPOSED INVESTMENTS [2]			
Grazing	$	0 to +965	+965
Construction activity [3]	$	0 to +784	+784
Total [4]	$	0 to +965	+965
INCOME FROM ALL OUTPUT CHANGES			
All categories [4]	$	0 to +965	+965

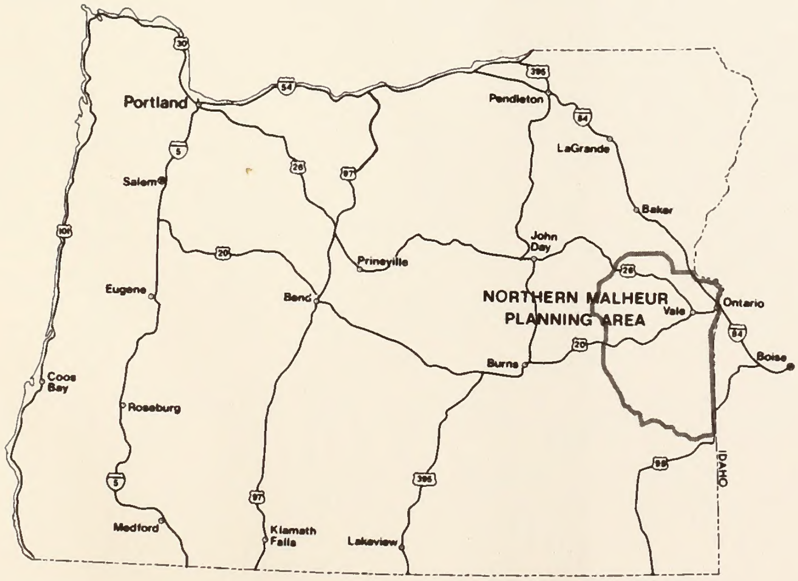
[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $5,700 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.





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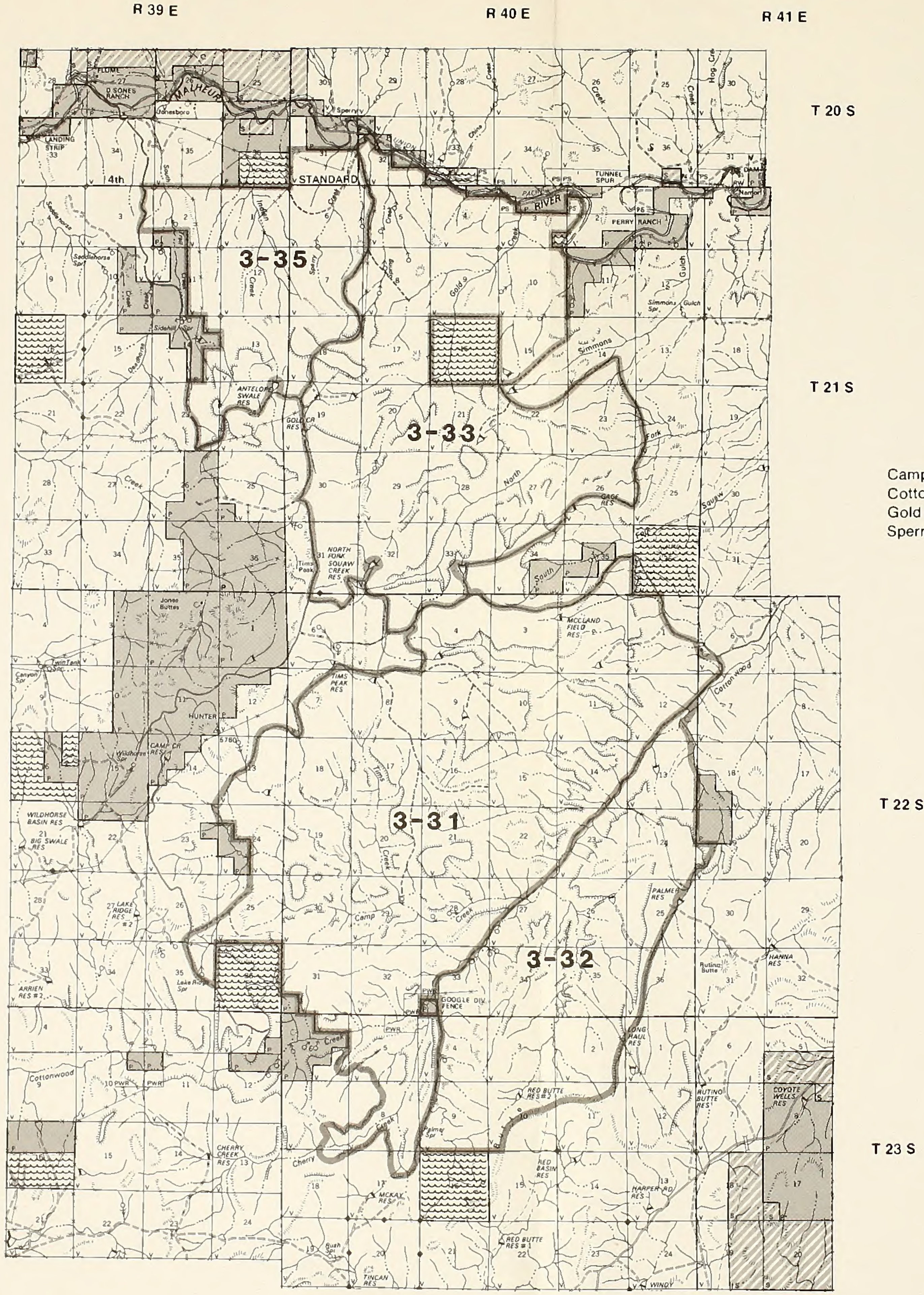
Vale District

Cottonwood Creek WSA's

LOCATION MAP

10 0 10 MILES

MAP 1



Camp Creek WSA OR-3-31
Cottonwood Creek WSA OR-3-32
Gold Greek WSA OR-3-33
Sperry Creek WSA OR-3-35

LEGEND

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ State

■ Private

≋ BLM Surface-State or Private Subsurface (Split Estate)

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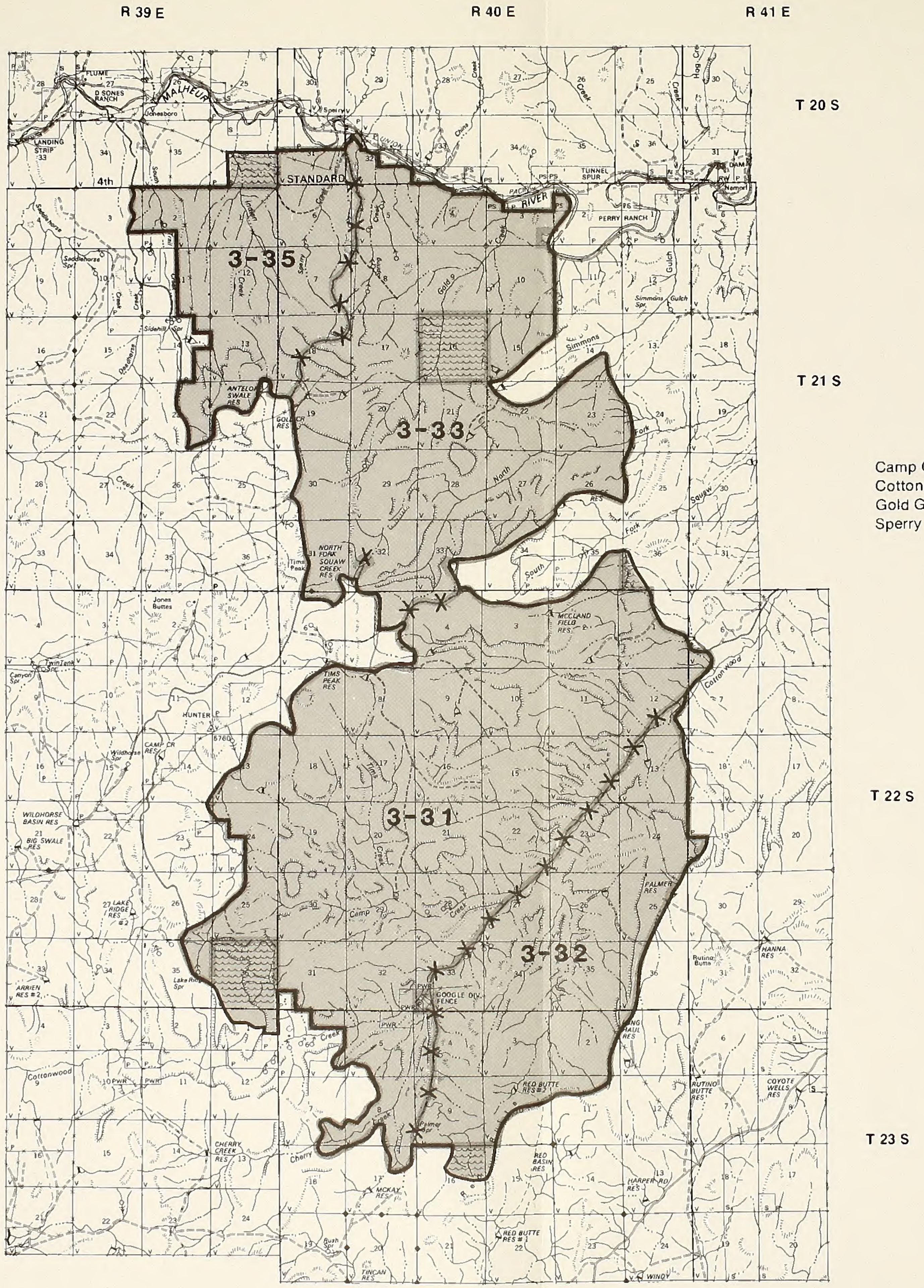
Cottonwood Creek WSA's

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



Camp Creek WSA OR-3-31
Cottonwood Creek WSA OR-3-32
Gold Greek WSA OR-3-33
Sperry Creek WSA OR-3-35

LEGEND

- ▬ Wilderness Study Area Boundary
- ▢ Recommended Suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- ✕—✕ Recommended Road Closure

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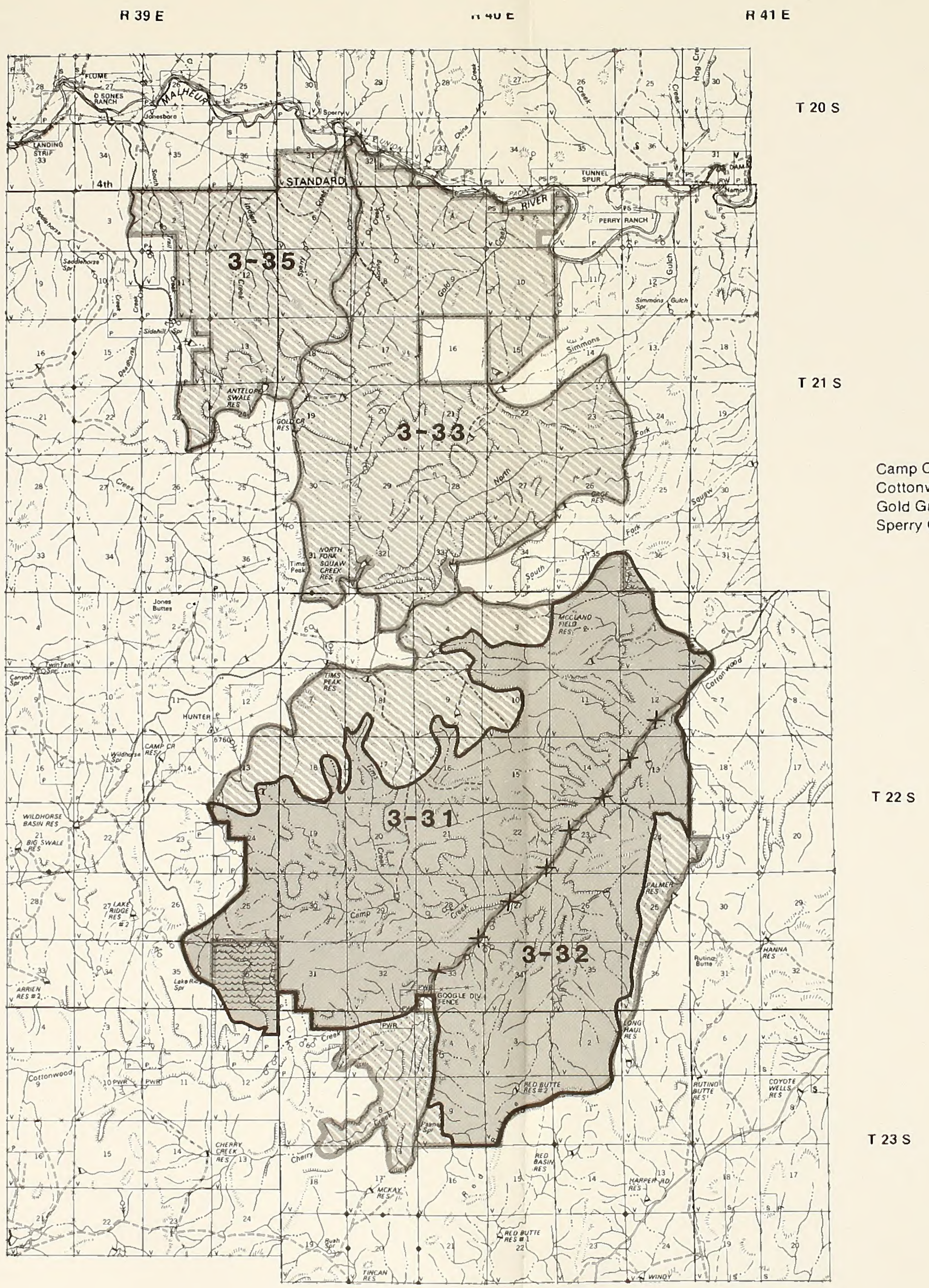
Cottonwood Creek WSA's

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



Camp Creek WSA OR-3-31
Cottonwood Creek WSA OR-3-32
Gold Greek WSA OR-3-33
Sperry Creek WSA OR-3-35

N

LEGEND

▬	Wilderness Study Area Boundary
▩	Recommended Suitable for Wilderness
▨	Recommended Non-suitable for Wilderness
▤	Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
✕—✕	Recommended Road Closure

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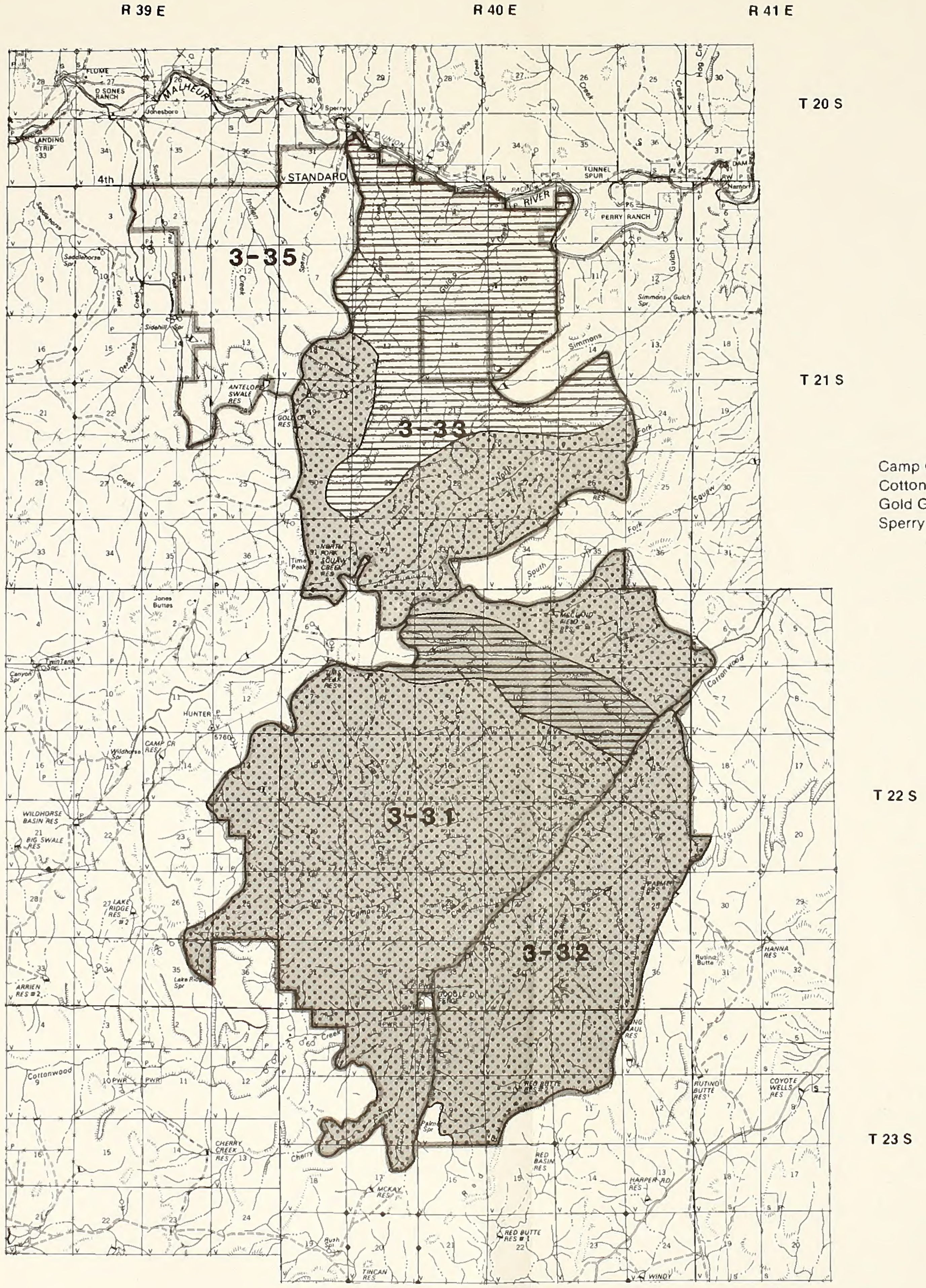
Cottonwood Creek WSA's

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 4



Camp Creek WSA OR-3-31
Cottonwood Creek WSA OR-3-32
Gold Creek WSA OR-3-33
Sperry Creek WSA OR-3-35

- ▒ **Medium Potential (3A) for Mercury**
- ⁙ **Medium Potential (3A) for Gold and Silver**
- ▤ **Medium Potential (3B) for Gold and Silver**

Entire WSA:
Medium Potential
(3B) for Oil and Gas and Perlite
(3A) for Bentonite
(3C) for Optical Calcite

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Cottonwood Creek WSA's

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 5

Camp Creek WSA, OR-3-31. East-central portion of the WSA looking west up Wildcat Canyon. Within area recommended suitable under the enhanced alternative and partial (preferred) alternative. August 1983

Camp Creek WSA, OR-3-31 and Cottonwood Creek WSAs, OR-3-32. Looking southwest up Cottonwood Creek Canyon. Camp Creek WSA is on the right while Cottowood Creek WSA is on the left. Within area recommended suitable under the enhanced and partial (preferred) alternatives. The boundary road separating the two WSAs runs up the canyon but is not visible in this photo. August 1983

Gold Creek WSA, OR-3-33. Southwestern portion of the WSA looking northeast down Gold Creek Canyon. Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. Split-estate land included in the canyon bottom where creek turns to the right. August 1983.

Gold Creek WSA, OR-3-33. Southwestern portion of the WSA looking north across plateau west of Gold Creek. Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. August 1983.

Sperry Creek WSA, OR-3-35. Central portion of WSA looking north down Sperry Creek (background is outside the WSA). Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. The slopes in the background are north of State Highway 20 and across the Malheur River and outside the WSA. August 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Cedar Mountain Wilderness Study Area (OR-3-47)

General Description of Study Area

The Cedar Mountain wilderness study area (WSA) is located in Malheur County, approximately 50 miles southwest of Vale and 30 miles northwest of Jordan Valley. It lies midway (approximately 25 miles) in a triangle between State Highway 78 and U.S. Highways 20 and 95 (see map 1).

The shape of the WSA is irregular. It is approximately 10 miles wide and 8 miles long. It contains 31,440 acres of public land (see map 2). There are two 640-acre sections of split-estate land (federally managed surface, state or privately owned subsurface mineral rights), totaling 1,280 acres, and one 80-acre parcel of private land inside WSA. In addition, a third section (640 acres) of split estate is located along a dead-end road in the north part of the WSA. The parcel is not inside the WSA because the WSA boundaries extend along the dead-end road, but the parcel is surrounded by BLM land.

The boundary consists of a fence line on the north and BLM roads and private and split-estate land on the remainder.

Two dead-end roads enter the WSA forming part of the boundary, one from the northern boundary and the other from the western boundary; each ends at a reservoir.

The entire WSA is comprised of Cedar Mountain and its slopes with elevations ranging from 3,940 feet to 5,560 feet. The base of the mountain is approximately at the boundary of the WSA. Cook Stove Basin contains a natural playa (shallow lake during wet years), and is located west of the summit along the crest of the mountain range.

The WSA lies within the sagebrush steppe ecological zone, a semiarid ecosystem dominated by sagebrush-grassland plant communities, and consists of big sagebrush, wheatgrass and Idaho fescue. Western juniper grows singly and in dense slumps or stands at the higher elevations.

Interrelationships

Cedar Mountain WSA is adjacent to Lower Owyhee Canyon WSA (OR-3-110) on the south and southeast. BLM access roads separate the two WSAs.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- oil and gas potential in the area,
- split-estate and private inholdings (the effects of wilderness designation on private lands are addressed in the Statewide EIS volume),
- a dead-end road in the area,
- numerous existing range projects, and
- possible development of a powerline in a potential north-south utility corridor.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

A partial alternative is not analyzed because there are no opportunities to eliminate conflicts of wilderness designation with other resource uses by recommending a portion of the area nonsuitable for wilderness designation.

All Wilderness

The all wilderness alternative would recommend all 31,440 acres of public land in the WSA as suitable for wilderness (see map 2). For purposes of analysis, it is assumed none of the split-estate or private land within the WSA would be acquired. Both dead-end roads would remain open to motor vehicles.

Enhanced Wilderness

The enhanced wilderness alternative would recommend all 31,440 acres of public land in the WAS suitable as wilderness (see map 3). In addition, an attempt would be made to acquire 80 acres of private and 1,920 acres of split-estate inholdings as well as 240 acres of adjacent split-estate outside the southern boundary. These parcels could be acquired through purchase or exchange with willing land owners. Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 33,680 acres.

In addition, the two dead-end roads would be closed, one 4 1/2 miles to Cook Stove Basin Reservoir and the other 1/2 mile to North Gallagher Reservoir. The southern boundary would be adjusted to include the adjacent 240-acre parcel of split estate.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development,
- continued vehicle use limited to existing routes,
- construction of livestock improvement projects, including four reservoirs, and
- possible powerline construction in a potential north-south utility corridor across the western fringe of the WSA.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The WSA would be manageable as wilderness, but it might be difficult to ensure that wilderness values would be preserved over the long term. Future developments on inholdings and on lands adjacent to the WSA could detract from the area's wilderness

Table 1. Summary of Proposed Management Under Each Alternative, Cedar Mountain WSA (OR-3-47)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	31,440	31,440	0
Acres Closed to ORVs by Wilderness Designation	31,440	31,440	0
Miles of Roads Closed	0	5	0
Miles of Ways Closed	13	13	0
Acres of Full Fee Estate Acquired[1]	0	80	0
Acres of Split Estate Acquired [1]	0	2,160	0
Acres Withdrawn from Mineral Location and			
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	31,440	31,440	0
Structural Livestock Projects Developed: Reservoirs & Waterholes (numbers)	0-3	0-4	4

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

qualities. Minerals could be developed on the split-estate inholdings. If all four split-estate parcels were developed, the effect on wilderness values would be widespread because the parcels are scattered across the WSA.

The 80-acre inholding could be used in ways which would adversely affect the wilderness values of surrounding public land. The parcel is located near the top of Cedar Mountain, so development there might be visible from a substantial portion of the WSA. All of the inholdings are now used for livestock grazing.

There is a concentration of livestock reservoirs and fences in the study area. Livestock management activities around the reservoirs, such as periodic visits by ranch hands to check the livestock's condition, would detract from other visitors' sense of solitude. Activities associated with maintenance of the reservoirs and fences also would detract from opportunities for solitude.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of intensively managing livestock in the area outweigh the benefits of preserving wilderness values. The benefits would be unconstrained maintenance of numerous existing livestock facilities (13 reservoirs, 21 miles of fence, and 18 miles of access roads and ways), management of livestock, and construction and maintenance of four proposed reservoirs.

The benefits of designating the area wilderness are uncertain due to the manageability problems identified in the previous manageability section. There is a concentration of existing livestock projects and a potential for further development on the inholdings and adjacent split-estate and private lands, as well as a powerline along the western portion of the study area.

The no wilderness/no action alternative would retain the option for exploration and development of energy and mineral resources.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA appears generally natural. There are 22 man-made features within the WSA consisting of 13 reservoirs, two fences totaling 21 miles, five ways (vehicle routes established and maintained solely by the passage of vehicles) totaling 13 miles, and two structures (a corral and a weather station). These features influence naturalness in approximately 6 percent of the study area. (The area of influence is an estimate of the acreage in the WSA from which these features can be seen.)

There are also man-made features outside the WSA, which influence naturalness within the WSA, consisting of water developments, a fence, boundary roads, a way, and a ranch. The influence of man-made features across the northwestern portion of the WSA is compounded by the sights and sounds of ranching activities outside the area. They diminish the WSA's apparent naturalness on the open, west-facing slopes.

Table 2. Summary of Environmental Consequences of Alternatives, Cedar Mountain WSA (OR-3-47)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 31,440 acres to the NWPS. Preserves natural character of plant and animal communities, maintains wilderness characteristics, and expands diversity of NWPS by adding disjunct stand of juniper with forest-dwelling wildlife. Development of inholdings could adversely affect wilderness values. Closure of 13 miles of ways would enhance wilderness values. Area manageable as wilderness, but management could be difficult because of cumulative impacts of dispersed livestock management developments and activities, outside sights and sounds, and potential development of split-estate and private inholdings.	Would add 33,680 acres to NWPs, assuming acquisition of private and split-estate inholdings and adjacent parcels. Closing 13 miles of ways and 5 miles of roads would enhance wilderness values. Area would be more manageable as wilderness than under all wilderness.	Wilderness characteristics could be adversely affected by mineral development and construction of facilities within designated utility corridor.
Energy and Mineral Development	Development precluded on 31,440 acres, including 31,440 acres with moderate potential for oil and gas.	Same as all wilderness, except development precluded on an additional 2,240 acres if private and split-estate land is acquired.	No impact.
Livestock Grazing	Increase of 150 AUMs of forage and better livestock distribution would be foregone if proposed reservoirs not allowed.	Increase of 200 AUMs of forage and better livestock distribution would be foregone if proposed reservoirs not allowed.	150 additional AUMs and better livestock distribution realized.
Utility Corridor Routing	Potential utility corridor could not be located within WSA. Relocation would not significantly increase cost of construction.	Same as all wilderness.	No impact.
Recreation Use	Vehicle use and access for primitive recreation would be eliminated on 13 miles of ways. Vehicle-oriented recreation would be reduced slightly.	Same as the all wilderness, except closure of 5 additional miles of roads would eliminate all vehicle-oriented recreation.	No impact.
Economic Value and Local Income	Decrease in annual economic value could range from $37 to $66, depending on what proposed projects would be allowed in wilderness. Local personal income would increase by $804 to $3,216 depending on these same factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in in recreation use. The maximum increase in transportation costs to livestock operators would be $27.	Decrease in annual economic value could range from $27 to $86, depending on whether proposed projects would be allowed in wilderness. Changes in local personal income would range from an increase of $3,216 to no change, depending on the same factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use. The maximum increase in transportation costs to livestock operators would be $27.	Decrease in economic value by $39 and increase in local personal income by $3,216.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude are outstanding due to the large size of the study area and the topographic and vegetative screening in the area. The undulating topography coupled with juniper vegetation on Cedar Mountain provide excellent screening for solitude.

Opportunities for primitive types of recreation also are outstanding. They include backpacking, camping, horseback riding and bird watching. Opportunities for hunting mule deer, antelope and chukar are average.

Special Features

Western juniper grows in open to moderately dense stands on the upper slopes of Cedar Mountain. Juniper grows on the mountain and not on the surrounding lower lands because there is more precipitation on the mountain than at lower elevations. It is not likely that juniper will spread to the lower slopes. The stand is multi-aged, ranging from very old trees to seedlings.

The WSA supports a small herd of Rocky Mountain elk, which have recently migrated from an established herd on Stockade Mountain.

Diversity in the National Wilderness Preservation System (NWPS)

The WSA is located in the Intermountain Sagebrush Province, according to the Bailey-Küchler method of classifying ecosystems, and its potential natural vegetation is sagebrush steppe. Of the plant communities listed in the Owyhee Upland section of the Oregon Natural Heritage Plan, the following are found in the WSA: western juniper/big sagebrush/bluebunch wheatgrass, big sagebrush/bluebunch wheatgrass, and big sagebrush/Idaho fescue.

Boise, Idaho is the only standard metropolitan statistical area with a population over 100,000 within 5 hours' driving time of the study area.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data by TERRADATA, a consulting firm under contract with BLM. Technical details of the findings of the evaluation are in a TERRADATA report titled "Assessment of Geology, Energy, and Mineral Resources of Cedar Mountain Geologic Resource Area." Based on additional information such as general mining information and oil and gas leases, BLM geologists reevaluated the report.

The WSA is within the Cedar Mountain geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Oil and gas and geothermal are the main potential energy resources in the area. Because of young volcanism and above normal heat flow, the WSA is considered favorable for thermal waters for direct-use heat application. Oil and gas potential will largely depend on the presence of suitable subsurface marine rock. There has been no deep drilling in the vicinity that has penetrated the Tertiary volcanic cover. The entire WSA has moderate favorability for oil and gas.

The mineral potential classifications for the WSA are shown in table 3.

There were no mining claims and no oil and gas or geothermal leases in the WSA as of January 1, 1984.

The surface of the WSA is comprised of Quaternary and Tertiary rocks. Quaternary rocks consist of alluvium and thin flows of open textural olivine basalt and minor basalt flow breccia along the western margin. Tertiary rocks cover the rest of the area and consist of mafic vent rocks (basaltic and andesitic agglomerate, breccia, scoria, cinders, flow and intrusive masses), underlain by a thick accumulation of Tertiary volcanic and some sedimentary rocks.

Vegetation

Vegetation throughout the WSA is characteristic of sagebrush steppe ecosystems. The successional stage is predominantly late seral in all but the southwestern portion which is in the mid-seral stage. (Seral refers to the stage of ecological

Table 3. Classification of Energy and Mineral Potential, Cedar Mountain WSA (OR-3-47)

Commodity	Classification Area	Confidence Level	Level
Metals	Entire WSA	1	B
Geothermal	Entire WSA	2	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	2	B
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	A
Diatomite	Entire WSA	2	C
Zeolites	Entire WSA	1	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The climax vegetation in most of the area would be a bluebunch wheatgrass/Wyoming big sagebrush community with western juniper at the upper elevations of Cedar Mountain.

Trees are scattered throughout this zone with several dense stands occurring near the summit. Stands of Idaho fescue can be found intermingled with big sagebrush at the upper elevations below the juniper community.

Wildlife

The WSA supports a small herd of Rocky Mountain elk that have recently migrated from an established herd on Stockade Mountain. Little is known about their seasonal movements and habitat needs in this area.

Mule deer summer in this area, as the juniper cover and good quality range conditions provide good deer habitat compared with the surrounding land. Winter use generally occurs in the vicinity of the Owyhee River, which is about five miles southeast of the WSA.

Antelope use is low because of the rocky surface which restricts rapid movement and the juniper cover which restricts visibility. A few antelope use the lower foothills, which are relatively smooth and open.

Upland game birds including chukar and mourning dove also occur in moderate numbers. The area also provides diverse habitat for a wide variety of nongame wildlife.

Livestock Grazing

Portions of two grazing allotments are within the WSA. Table 4 summarizes existing and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and calf, or equivalent animals, for one month).

Existing livestock projects (among the man-made features mentioned in the Naturalness section) include 13 water developments, 21 miles of fence, and a corral.

Three reservoirs are proposed for construction in the WSA. They would allow better livestock distribution and provide a potential forage increase of 150 AUMs in the Turnbull allotment. A fourth reservoir is proposed for construction on a split-estate inholding. It would create an increase of 50 AUMs of forage in this allotment.

Vehicles are presently used to place salt and check livestock adjacent to the boundary roads and the ways in the WSA. Horses are hauled in and used to check livestock in isolated areas and to move them to and from the area.

Utility Corridor Routing

The Bonneville Power Administration (BPA) has under long-term consideration construction of a 500-kV power transmission line through a potential north-south corridor. The corridor would run through the western fringe of the WSA for six miles.

Recreation Use

Very little day hiking and backpacking occurs in the study area. Deer, antelope and chukar hunting is

Table 4. Existing and Potential Livestock Use, Cedar Mountain WSA (OR-3-47)

Grazing Allotmemt	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Quartz Mountain (No. 0406)	7,056	June-Nov.	15	1,010	0
Turnbull (No. 0303)	8,030	July-Sept. (Cedar Mtn) April-June (Sand Basin & Clark)	25	1,627	150
Totals	15,086			2,637	150

[1] Increase might or might not result in increased licensed use in the allotment (see narrative).

light. The boundary roads, the two dead-end roads, and most of the ways are used for hunting access. There is little off-road vehicle (ORV) use due to the rocky surface in the WSA.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 2,637 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $19,883 annually and local personal income generated by existing outputs amounts to $42,403 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 31,440 acres to the National Wilderness Preservation System (NWPS) and expand the diversity of the system by adding to it a unique ecosystem -- a small island of juniper inhabited by forest-dwelling wildlife and isolated within the high desert shrub/grass ecosystem. The area's special wilderness features would remain relatively unchanged.

Thirteen miles of ways in the WSA would be closed allowing them to revegetate and thus enhancing the area's naturalness. Elimination of vehicle traffic would enhance opportunities for solitude and primitive recreation.

Development on the split-estate and private land, as well as construction of access to the inholdings, could adversely affect the naturalness of these portions of the area. Human activity from the development would also reduce the opportunities for solitude. The private inholding is used for livestock grazing.

The **enhanced wilderness alternative** would add 33,680 acres to the NWPS, assuming the 2,240 acres of private and split-estate inholdings, as well as adjacent split-estate parcels, could be acquired.

Acquisition of private and split-estate land would eliminate the possibility of mineral development on the parcels and the associated surface disturbing activities, including access road construction. This would preserve the area's naturalness and opportunities for solitude and primitive recreation. Closure of five miles of roads and 13 miles of ways would enhance wilderness values. The area's special wilderness features would be present.

Under the **no wilderness/no action alternative**, any mineral development could adversely affect wilderness values, including the area's special wilderness features and opportunities for solitude and primitive recreation. Some adverse effects from oil and gas or geothermal lease development could be mitigated through lease stipulations.

Development of the potential utility corridor could reduce the amount of natural area and opportunities for solitude and primitive recreation. Construction of powerlines in the corridor could adversely affect naturalness of up to 4,300 acres (approximately 14 percent) of the WSA.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 31,440 acres under the **all wilderness alternative**, and 31,440 acres plus an additional 2,240 acres if private and split estate is acquired, as proposed under the **enhanced wilderness alternative**. These withdrawals would include the area rated moderate for oil and gas, which encompasses the entire

WSA.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the three proposed reservoirs might or might not be allowed depending upon a site-specific analysis of whether they conform with Wilderness Management Policy. If not allowed, 150 AUMs of available forage within the allotment could not be utilized.

The benefit/cost ratio for these projects is less than 1:1.

Under the **enhanced wilderness alternative**, four proposed reservoirs might or might not be allowed, depending on a site-specific analysis of whether they conform with Wilderness Management Policy. If not allowed, 200 AUMs of available forage and better livestock distribution could not be utilized.

Under the **no wilderness/no action alternative**, the reservoirs would be allowed and the 150 AUM forage increase in the allotment would be realized along with better livestock distribution.

Effects on Utility Corridor Routing

Under the **all wilderness and enhanced wilderness alternatives**, the potential north-south utility corridor could not be located within the WSA. Relocation outside the WSA to the west would add negligible additional length to the corridor. Under the **no wilderness/no action alternative**, the corridor could be located as proposed.

Effects on Recreation Use

Under the **all wilderness alternative**, use of motor vehicles on the ways for recreation would be eliminated. Such use is currently light; therefore, impacts would be minor.

Under the **enhanced wilderness alternative**, vehicle-oriented recreation would be eliminated within the WSA with closure of the dead-end roads as well as ways. Since current use is light, the impacts would be minor.

Under the **no wilderness/no action alternative**, no changes in recreation use are expected.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the reservoirs proposed for this WSA, would be constructed if the area were designated wilderness.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements and grazing operator access were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The **all wilderness and enhanced wilderness alternatives** would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $27 per year.

Under the all wilderness and enhanced wilderness alternatives additional costs could be incurred if the utility corridor is relocated outside the WSA.

Table 5. Effects of Alternatives on Annual Economic Value, Cedar Mountain WSA (OR-3-47) (1981 price levels)

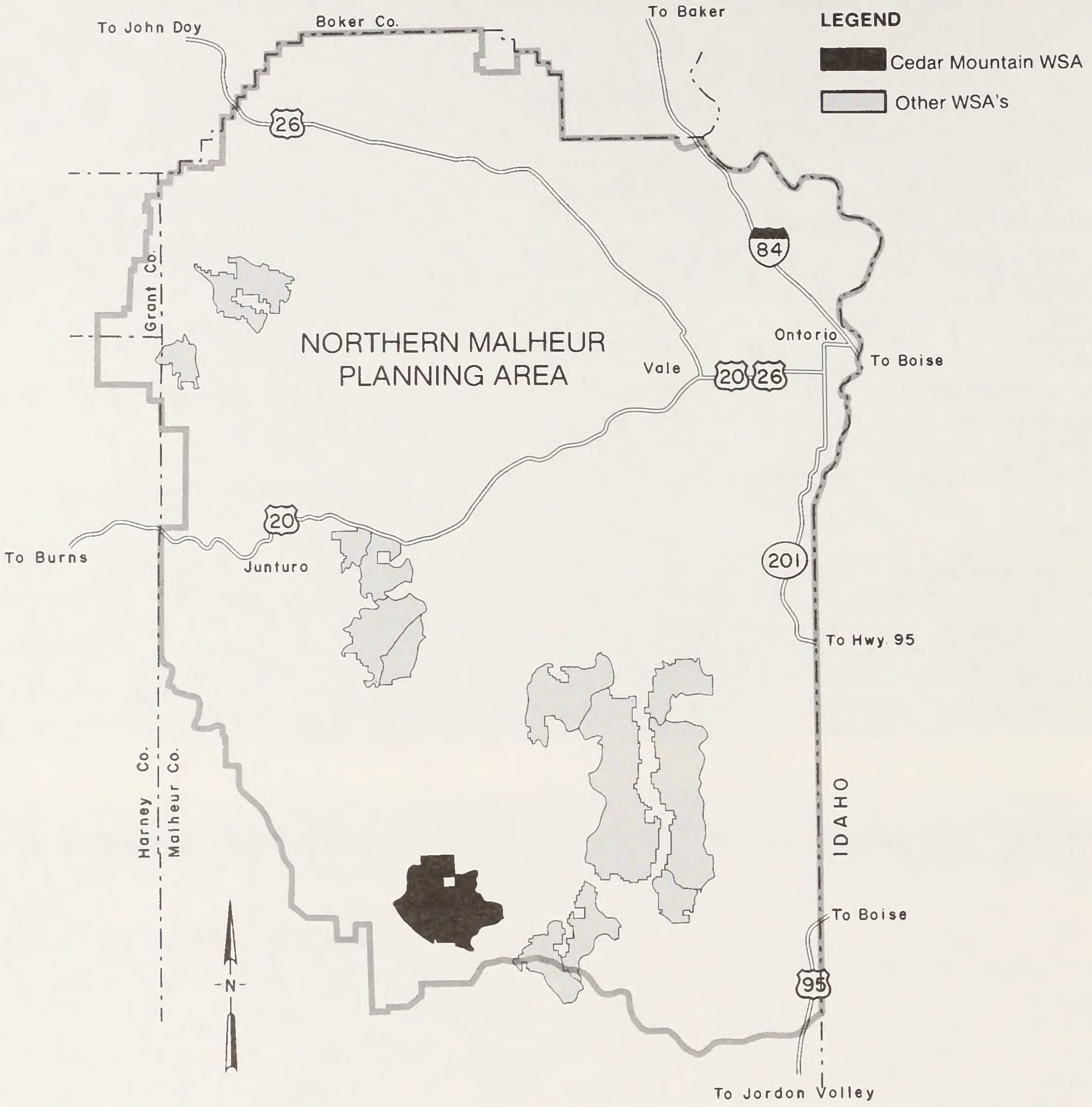
Item	Unit of Measure	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing: Investment[1]	AUM	+50 to +200	0 to +200	+200
VALUE OF PLANNED INVESTMENTS[2]				
Grazing	$	+377 to +1,508	0 to +1,508	+1,508
Investments[3]	$	-387 to -1,547	0 to -1,547	-1,547
Net Economic Value[4]	$	-39 to -10	-39 to 0	-39
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access[5]	$	-27	-27	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-66 to -37	-66 to -27	-39

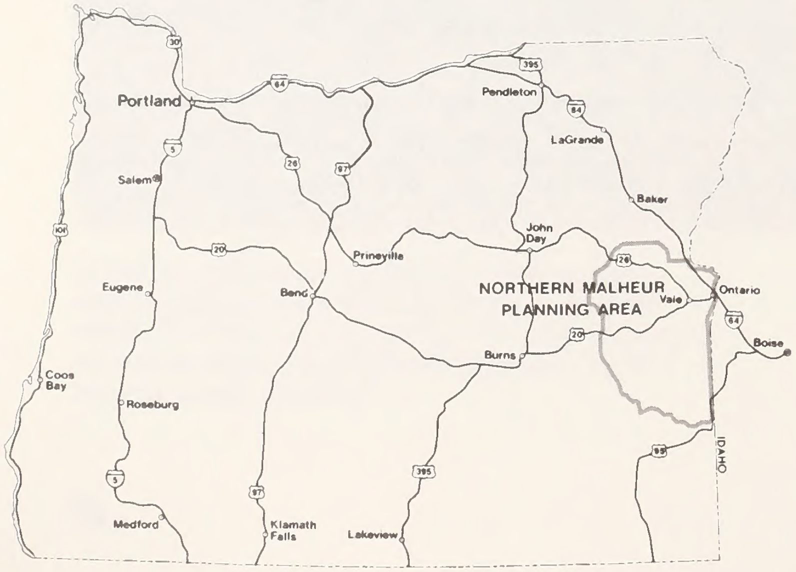
[1] Expected future increases due to range improvement investments.
[2] Structural projects involving up to $19,200 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[4] For alternatives reflecting range of negative net values (i.e. investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.
[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 6. Effects of Alternatives on Local Personal Income, Cedar Mountain WSA (OR-3-47) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing: Investment[1]	AUM	+50 to +200	0 to +200	+200
VALUE OF PLANNED INVESTMENTS[2]				
Grazing	$	+804 to +3,216	0 to +3,216	+3,216
Construction activity[3]	$	+661 to +2,642	0 to +2,642	+2,642
Total[4]	$	+804 to +3,216	0 to +3,216	+3,216
INCOME FROM ALL OUTPUT CHANGES				
All categories[4]	$	+804 to +3,216	0 to +3,216	+3,216

[1] Expected future increases due to range improvement investments.
[2] Structural projects involving up to $19,200 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing activity because it is not sustained over the analysis period.
[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.





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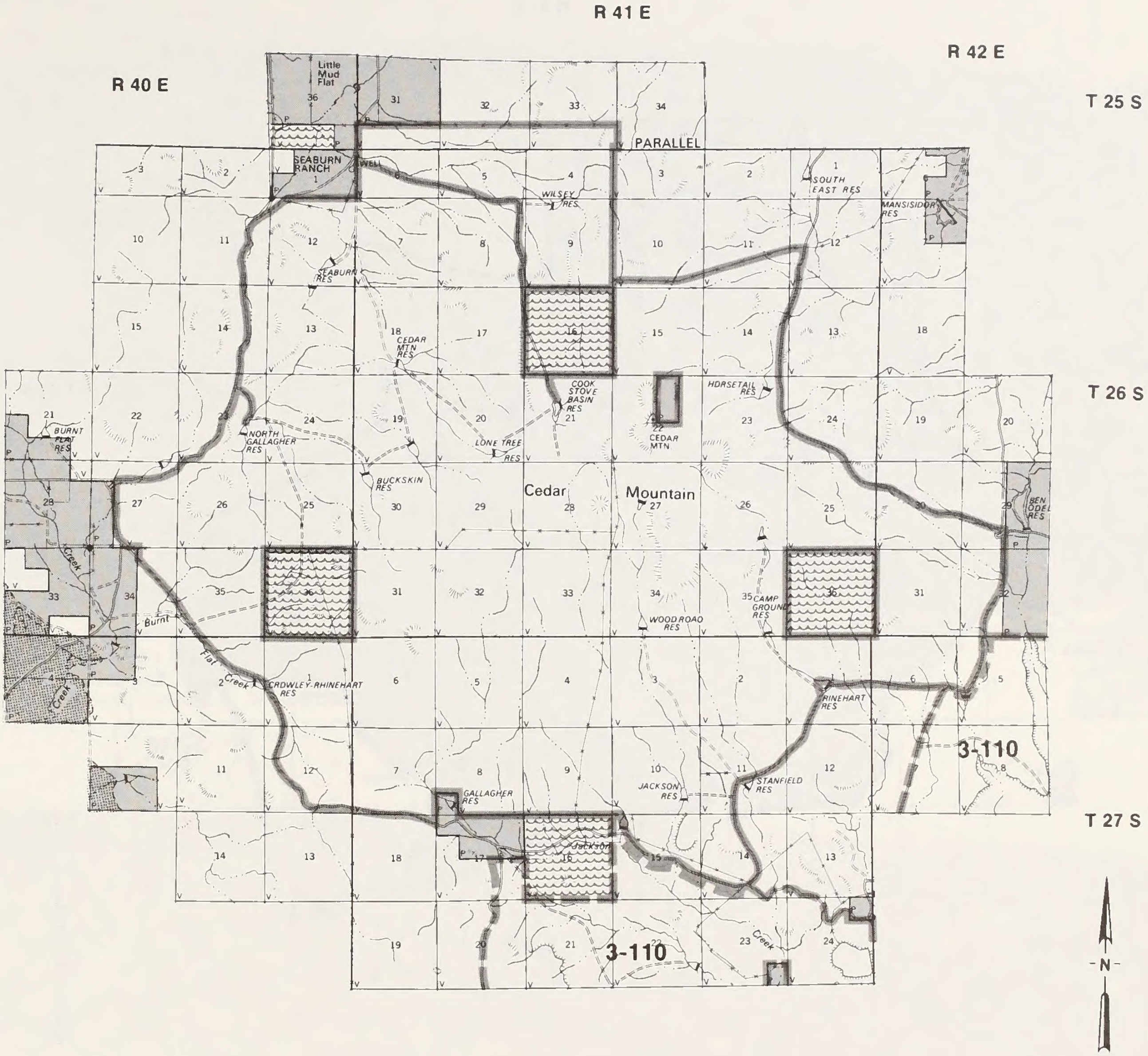
Vale District

Cedar Mountain WSA
OR-3-47

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

- - Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

■ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

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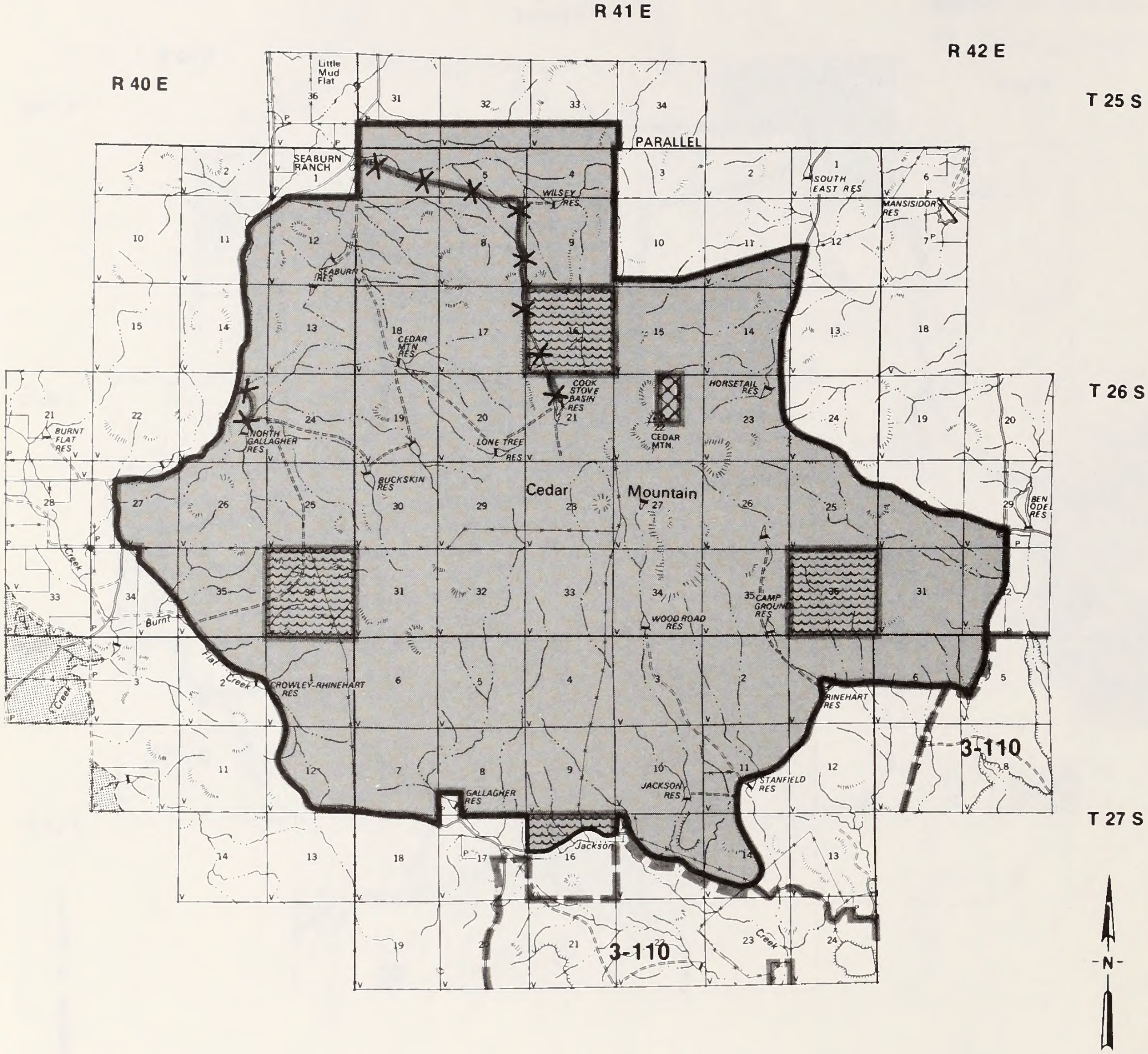
Cedar Mountain WSA
OR-3-47

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

▭ Recommended Suitable for Wilderness

▩ Non-Federal Land within
Recommended Wilderness

▤ Non-Federal Minerals (Split Estate)
within Area Recommended for Wilderness

✕—✕ Recommended Road Closure

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Cedar Mountain WSA
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ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3

Cedar Mountain WSA, OR-3-47. Northeast portion of WSA looking east. Within area recommended suitable under the enhanced alterntaive and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Cedar Mountain WSA, OR-3-47. West-central portion of WSA looking southeast. Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. Small reservoir typical of range developments in this WSA shown at center of photo. September 1983.

Dry Creek Wilderness Study Area (OR-3-53)

General Description of Study Area

Dry Creek wilderness study area (WSA) is located west of the Owyhee Reservoir in Malheur County, approximately 27 miles southwest of Vale (see map 1).

The WSA contains 22,540 acres of public land. There is one parcel of about 640 acres of split-estate land (federally managed surface, state or privately owned subsurface mineral rights) within the study area (see map 2). The WSA is approximately seven miles long and five miles wide. It is bounded by BLM roads and private property along the northern and western boundaries, and two parcels of split-estate land, one along the northern and one along the southern boundary.

The dominant topographic feature of the WSA is Dry Creek Canyon. This canyon has a perennial stream and bisects the WSA for nine miles until leaving it at the northeastern boundary near the Dry Creek Arm of Lake Owyhee.

Dry Creek has carved a scenic canyon through the surrounding terrain. The width of the canyon's floor usually averages between 250 and 500 feet, but near the confluence of Freezeout Creek it widens to three-fourths of a mile. Sage-covered slopes (often with gradients greater than 50%) form the sides of the canyon. Frequent cliffs, rimrock, and outcroppings provide picturesque diversity. These geologic features are composed of both basalt and layered ash deposits, thus contributing a variety of colors to the scenery.

With the exception of several drainages such as Freezeout, Deadhorse, and Sheep Creeks, the terrain away from Dry Creek is less steep. Rolling hills and numerous drainages of varying lengths characterize the landscape. There are also several buttes, ridges and tablelands. Sagebrush and grasses grow in most of the area. Riparian plants grow along Dry Creek and other perennial streams.

Interrelationships

The Dry Creek Buttes WSA (OR-3-56) is adjacent to the southeast boundary of Dry Creek WSA for approximately six miles. The two WSAs are separated by a road.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- an existing Pacific Power & Light (PP&L) transmission line near the WSA,
- potential development of mineral rights,
- protection of the WSA's recreational opportunities and special features,
- current livestock grazing in the WSA and construction of proposed livestock projects, and
- problems resulting from a single travel corridor in the WSA.

Also identified as an issue was the possibility of combining this WSA and adjacent or nearby WSAs (Dry Creek Buttes, Wild Horse Basin, Honeycombs, and Slocum Creek) and the former Upper Leslie Gulch WSA into a single wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

An alternative which would combine the Dry Creek WSA with the Dry Creek Buttes WSA is not analyzed because it is not feasible to close the road separating Dry Creek WSA and Dry Creek Buttes WSA; this road is the only major route on the west side of Owyhee Reservoir.

Another alternative which would combine this WSA with the Dry Creek Buttes, Slocum Creek, Honeycombs, and Wild Horse Basin WSAs and the former Upper Leslie Gulch WSA is not analyzed because: it would not be practical to close the road between the Dry Creek and Dry Creek Buttes WSAs; and because the Owyhee Reservoir lies between the Dry Creek WSA and the other WSAs, and the reservoir and adjacent lands managed by the Bureau of Reclamation are not subject to wilderness consideration.

A partial alternative which would recommend only a portion of the WSA suitable as wilderness is not analyzed because there is no opportunity to resolve major conflicts or manageability problems by recommending part of the WSA suitable as wilderness.

All Wilderness

The all wilderness alternative would recommend all 22,540 acres of public land in the WSA suitable as wilderness (see map 2). For purposes of analysis, it is assumed the split-estate inholding would not be acquired.

Enhanced Wilderness

The enhanced wilderness alternative would recommend all 22,540 acres of public land in the WSA suitable as wilderness (see map 3). In addition, an attempt would be made to acquire the 640-acre split-estate inholding and portions, totaling 320 acres, of the two adjacent parcels of split estate. These parcels could be acquired through purchase or exchange with willing owners.

Assuming acquisition of these inholdings and adjacent split-estate land, a total of 23,500 acres would be recommended suitable as wilderness under this alternative.

The boundary adjacent to the split-estate parcels would be moved to the road.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- construction of proposed livestock projects, including a fence and development of two springs,
- designation of the WSA as open to ORV use, and
- continued availability for mineral exploration and development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The all wilderness and enhanced wilderness alternatives would be manageable as wilderness, but the area could be difficult to manage under the all wilderness alternative. A parcel of split estate lies in Dry Creek Canyon. The canyon contains most of the wilderness values in the WSA, and it would be the corridor which most visitors to the area would travel. If minerals were developed on the split estate, it would be very difficult to manage the area to preserve the most significant wilderness values in the WSA.

If it were determined that owners of the numerous mining claims in the WSA had discovered a valuable mineral deposit before the area was designated wilderness and if extensive mining occurred, it would be difficult to preserve wilderness values in the vicinity of the claims. A powerline can be seen from most of the high points in the WSA, and that reduces the manageability of the area as wilderness.

Table 1. Summary of Proposed Management Under Each Alternative, Dry Creek WSA (OR-3-53)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	22,540	22,540	0
Acres Closed to ORVs by Wilderness Designation	22,540	22,540	0
Miles of Ways Closed	9	9	0
Acres of Split Estate Acquired [1]	0	960	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	22,540	22,540	0
Structural Livestock Projects Developed:			
Springs (number)	0-2	0-2	2
Fences (miles)	0-4	0-4	4

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

The area would not be as difficult to manage as wilderness under the enhanced wilderness alternative, assuming the split-estate parcel could be acquired.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of retaining options for development of mineral and other resources would outweigh the benefits of preserving wilderness values in the WSA, particularly in view of the difficulties that could be encountered in managing the area as wilderness. A major reason for selecting the no wilderness/no action alternative as preferred is the fact that the area's naturalness is limited by the visibility of a 500-kV powerline located just north of the WSA.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA is generally natural. Man-made features are scattered and, because of the screening provided by the rugged terrain, are substantially unnoticeable. Some 18 man-made features influence 14 percent of the WSA. (The area of influence is an estimate of the acreage within the WSA from which these features can be seen.) They include eight ways (vehicle routes established and maintained solely by the passage of vehicles) totaling 9 miles, five fences totaling 8 miles, three reservoirs, and two springs.

Outside sights and sounds greatly influence a visitor's perception of the study area's naturalness. They substantially diminish the benefits of wilderness designation. The majority of these man-made features influence the northern portion of the WSA. The PP&L 500-kV powerline constitutes the major outside man-made feature influencing naturalness within the WSA. The powerline can be seen from nearly all the high points and ridges in the WSA and from the area north of the canyon along the northern boundary. The line is not visible from inside the main Dry Creek Canyon and side

Table 2. Summary of Environmental Consequences of Alternatives, Dry Creek WSA (OR-3-53)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 22,540 acres to NWPS. Protects wilderness characteristics. Adverse effects could occur due to mining activity on split-estate. The area would be manageable as wilderness.	Would add 23,500 acres to NWPS, assuming the 960 acres of split-estate could be acquired. Impacts similar to all wilderness; possible adverse effects due to mining activity on split-estate would be prevented. Area recommended suitable under this alternative is manageable.	Possible adverse effects if increases in mining activity occur.
Energy and Mineral Development	Development precluded on 22,540 acres, including 22,540 acres with high potential for optical calcite and semiprecious gem stones and moderate potential for oil and gas, bentonite, diatomite, perlite and zeolites.	Same as all wilderness, except development precluded on an additional 960 acres if split-estate is acquired.	No impact.
Livestock Grazing	Potential increase of up to 40 AUMs and enhancement of riparian habitat could be foregone if proposed range improvements are not allowed.	Same as all wilderness.	Increase of 40 AUMs and enhancement of riparian habitat in Dry Creek Canyon would be realized.
Economic Value and Local Income	Decrease in annual economic value could range from $800 to $90, depending on what proposed projects would be allowed. Changes in local personal income would range from a decrease of $27 to a increase of as much as $616, depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use.	Same as all wilderness.	Decrease in economic value by $710 and increase local personal income by $643.

draws. Twin Springs campground can be seen from two areas in the extreme northeast corner of the WSA.

The area south of Dry Creek Canyon contains fewer man-made features. Dry Creek Canyon is affected only by fences and a cabin with corrals.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The major reason the area offers outstanding opportunities for solitude is the diverse topography associated with Dry Creek and its two side drainages, Sheep and Freezeout Creeks. These canyons with their steep walls, meanders, and angular ridges provide excellent topographic screening but are relatively short. Topographic screening is not good throughout the rest of the WSA because the terrain is mostly rolling shallow drainages. Away from the canyons, vegetative screening is minimal because shrubs and grasses seldom reach four feet in height.

Dry Creek Canyon would attract both day hikers and backpackers because it offers relatively easy hiking, isolated settings, and contains few man-made intrusions. Use would be concentrated within this narrow, open canyon, limiting the opportunity for solitude and unconfined primitive recreation. However, the opportunity for primitive recreation in the WSA is outstanding because of the diversity of possible activities available, including horseback riding, bird watching, fishing, hunting, sightseeing and photography.

Special Features

Two plant species of special interest, *Astragalus solitarius* and *Astralagus sterilis*, occur in the WSA. (These plant species are discussed further in the Vegetation section.)

The complexity and diversity of the natural community is greatly enhanced by the presence of year-round water, which provides aquatic and riparian habitats that contrast dramatically with the surrounding semi-desert environment. Dry Creek contains year-round water and supports riparian vegetation.

Diversity in the National Wilderness Preservation System (NWPS)

The WSA is in the Intermountain Sagebrush Province, according to the Bailey-Küchler method of classifying ecosystems and has the potential natural vegetation of sagebrush steppe. Of the plant communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, the WSA has big sagebrush/bluebunch wheatgrass.

The only standard metropolitan statistical area with a population over 100,000 within 5 hours' driving time of the WSA is Boise, Idaho.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment sampling by TERRADATA, a consulting firm under BLM contract. Technical details of the findings of the evaluation are in a BLM report titled "Assessment of Geology, Energy, Mineral Resources of Lake Owyhee Geologic Resource Area (GRA)". Based on additional information such as general mining information and oil and gas leases, the report was reevaluated by BLM geologists.

The WSA is within the Lake Owyhee geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA has been rated as having moderate favorability for occurrence of oil and gas, bentonite, diatomite, perlite and zeolites. It has high favorability for occurrence of optical calcite and semi-precious gem stones.

The mineral potential classifications for the WSA are shown in table 3.

Table 3. Classification of Energy and Mineral Potential, Dry Creek WSA (OR-3-53)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, silver, mercury)	Entire WSA	2	C
Geothermal	Entire WSA	1	B
Uranium/Thorium	Entire WSA	1	B
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	3	A
Diatomite	Entire WSA	3	B
Zeolites	Entire WSA	3	B
Optical Calcite	Entire WSA	4	D
Semiprecious gem stones	Entire WSA	4	D
Perlite	Entire WSA	3	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

As of January 1, 1984, there was one oil and gas lease (between 80 and 100 acres) in the WSA, and no geothermal leases. There were 100 mining claims in the area on January 1, 1984. So far as is known, the claimants are looking for semi-precious gem stones and precious metals. The largest group of claims is along the northeast boundary, north of Dry Creek on the slopes above Twin Springs Creek. Other claims are located along the southeast boundary in Sand Hollow, in the northwest extension of the WSA, and in Dry Creek Canyon in the southwest part of the WSA.

All of the surface rocks in the WSA are Tertiary, the most predominant rocks being a series of volcaniclastic and clastic fluviatile (river) and lacustrine (lake) rocks that contain conspicuous arkose sandstone derived from plutonic source. Other rock outcroppings consist of extrusive olivine basalts and other younger flows of basalt or andesite basalts. Paleozoic and Mesozoic rocks may occur at unknown depths since this area is within the margins of both the western Triassic and the western Late Paleozoic depositional basins. However, none of these units are exposed within the WSA.

Optical calcite is found in the southern part of the WSA. Extensive sampling that was done just adjacent to and south of this WSA showed scattered anomalous gold values.

Vegetation

Dominant vegetation in the WSA is Wyoming big sagebrush and bluebunch wheatgrass in mid- to late-seral stage. (Seral refers to the stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.)

Common riparian plants such as Lewis mock orange, willow, clematis, rushes and sedges are found along Dry Creek and other intermittent tributaries in the WSA.

The two plant species of special interest (mentioned in the Special Features section) occur within the WSA: *Astragalus sterilis* (sterile milk vetch), and *Astragalus solitarius* (weak milk vetch). These plants are candidate species for federal listings as threatened or endangered and depend upon site-specific conditions offered by tuffaceous ash deposits.

Wildlife

Mule deer and antelope occupy the WSA year around. Dry Creek supports a limited trout fishery. Except for high water in the spring, surface water is generally restricted to deep pools scattered along the drainage. Dry Creek provides the most important wildlife habitat in the WSA because of the perennial water and riparian vegetation. Upland game birds including chukar, California quail, and mourning doves are common. Nongame wildlife common to the intermountain region are abundant.

Livestock Grazing

Portions of two grazing allotments are within the WSA. Table 4 summarizes existing and potential livestock use in AUMs, (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Existing livestock developments in the WSA (among the man-made features mentioned in the Naturalness section) include: 8 miles of fence, 3 reservoirs, and 2 springs.

Development of two springs is proposed in Wallrock allotment to increase the quantity of water and forage available and improve the distribution of the livestock throughout the WSA. The current actual use in the WSA would be increased by 40 AUMs by the spring developments.

Four miles of fence are proposed in the Freezeout allotment to enhance the riparian habitat in Dry Creek Canyon. The level of livestock grazing would shift within the allotment. This would slightly reduce the current use in the portion of the allotment within the WSA.

Vehicles are presently used to place salt and to check livestock and reservoirs, primarily in the northwest portion of the WSA.

Recreation Use

Mule deer and chukar hunting is very popular, especially along Freezeout Creek and the eastern portion of Dry Creek. Twin Springs campground, which is located just outside the WSA, is used as a base camp for deer and chukar hunting and recreational prospecting. Trout are common in some sections of Dry Creek, but fishing pressure is light and generally incidental to other recreational activities.

Recreational ORV use is very slight. The area is designated as limited to ORV use. The eastern and northern boundary roads, however, are heavily used by recreationists as well as ranchers to reach areas outside of the WSA, because most of the hunting and fishing is physically limited to foot travel inside the WSA. ORV use is not expected to increase over existing low levels.

Table 4. Existing and Potential Livestock Use, Dry Creek WSA (OR-3-53)

Grazing Allotment	Licensed AUMs in Allotment (AUMs)	Period of Use	Percent of Allotment in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Wallrock (No. 0405)	8,546	04/01-10/31 11/01-04/30	13	983	40
Freezeout (No. 0404)	11,655	04/01-10/31	16	1,956	0
Totals	20,201			2,939	40

[1] Increase might or might not result in increased licensed use in the allotment (see narrative).

Economic Value and Local Income

Livestock grazing, oil and gas leasing, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there was one oil and gas lease and no geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 22,540 acres to the National Wilderness Preservation System (NWPS). The wilderness area would include rolling, sagebrush-covered hills, the narrow, steep-sided Dry Creek Canyon, and riparian lands along Dry Creek.

Wilderness designation would preserve the area's existing natural character, the outstanding opportunities for solitude and primitive recreation, and the area's special wilderness features unless mineral development occurred on the split-estate inholding or -- if claimants established valid rights by discovering a valuable mineral before wilderness designation -- on existing mining claims. Most of the current mining activity is centered just south of Twin Springs in the northeastern portion of the WSA. If fully developed, this mining would affect the wilderness values of a small portion of the WSA. The mining could be seen by people traveling on the Twin Springs Road, the major access to the WSA.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Dry Creek WSA (OR-3-53) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	2,939	$22,160	$47,259
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil & Gas Leases	Acres	90	90	27
Total			$22,250	$47,286

Wilderness designation under this alternative would not prevent the development of minerals on the split-estate land in Dry Creek Canyon. Development of this parcel would adversely affect the naturalness of the WSA. The only practical access would be along the bottom of Dry Creek Canyon. If mining activity occurs, it could affect Dry Creek Canyon, the riparian zone, the perennial stream, the area's wildlife populations, scenery, geologic formations, roadlessness, and generally natural setting for a third of the creek's length through the WSA.

Wilderness values would be enhanced as vegetation on 9 miles of ways, closed to vehicle use under this alternative, regenerate to natural condition. The elimination of vehicle use would also enhance opportunities for solitude and primitive recreation.

The **enhanced wilderness alternative** would add 23,500 acres to the NWPS, assuming the 960 acres of split-estate within and adjacent to the WSA could be acquired. Acquisition of the three parcels of split-estate would eliminate possible impacts from mineral development. The existing mining claims in the WSA could still be developed if a valid discovery were made before wilderness designation. If the claims were developed, the mining activities and access routes to the claims would adversely affect wilderness values in the vicinity. Wilderness values in the rest of the WSA would be preserved. Closure of 9 miles of ways would enhance wilderness values.

Under the **no wilderness/no action alternative**, any mineral development could adversely affect wilderness values, including the area's special wilderness features and opportunities for solitude and primitive recreation. Some adverse effects from oil and gas lease development could be mitigated through lease stipulations.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 22,540 under the **all wilderness alternative**, and 22,540 acres, plus an additional 960 acres if the split-estate land is acquired, as proposed under the **enhanced wilderness alternative**.

These withdrawals would include the areas rated moderate for oil and gas, bentonite, diatomite, zeolites, and perlite, and the areas rated high for optical calcite and semiprecious gem stones, which encompass the entire WSA.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Livestock Grazing

Under the **all and enhanced wilderness alternatives**, the development of two springs and a fence might or might not be allowed, depending on a site-specific analysis of whether they would conform with Wilderness Management Policy. If the spring developments were not allowed, an opportunity to better distribute livestock and increase livestock forage within the allotment by 40 AUMs would be foregone. If the fence is not allowed, the opportunity to enhance riparian habitat in Dry Creek Canyon would be foregone.

The two springs have a benefit/cost ratio of less than 1:1.

Under the **no wilderness/no action alternative**, the fence and spring developments could be constructed as proposed, enhancing riparian habitat and providing better livestock distribution with an increase in 40 AUMs within the allotment.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the fence and 2 spring developments proposed for this WSA, would be constructed if the area were designated wilderness. The column for the wilderness alternatives shows the effects as a range of values dependent upon whether structural improvements were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. There would be no impact and no increase in cost to the grazing operator in the WSA from road closures.

Table 6. Effects of Alternatives on Annual Economic Value, Dry Creek WSA (OR-3-53) (1981 price levels)

Item	Unit of Measure	Enhanced and All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +40	+40
Oil and Gas Leases	Acres	-90	0
VALUE OF PLANNED INVESTMENTS [2]			
Grazing	$	0 to +302	+302
Investments [3]	$	0 to -1,012	-1,012
Net Economic Value [4]	$	-710 to 0	-710
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Oil and Gas Leases	$	-90	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-800 to -90	-710

[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $12,599 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Annual average costs of investment expenditures amortized at 7.875% over 50-year period.

[4] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

Table 7. Effects of Alternatives on Local Personal Income, Dry Creek WSA (OR-3-53) (1981 price levels)

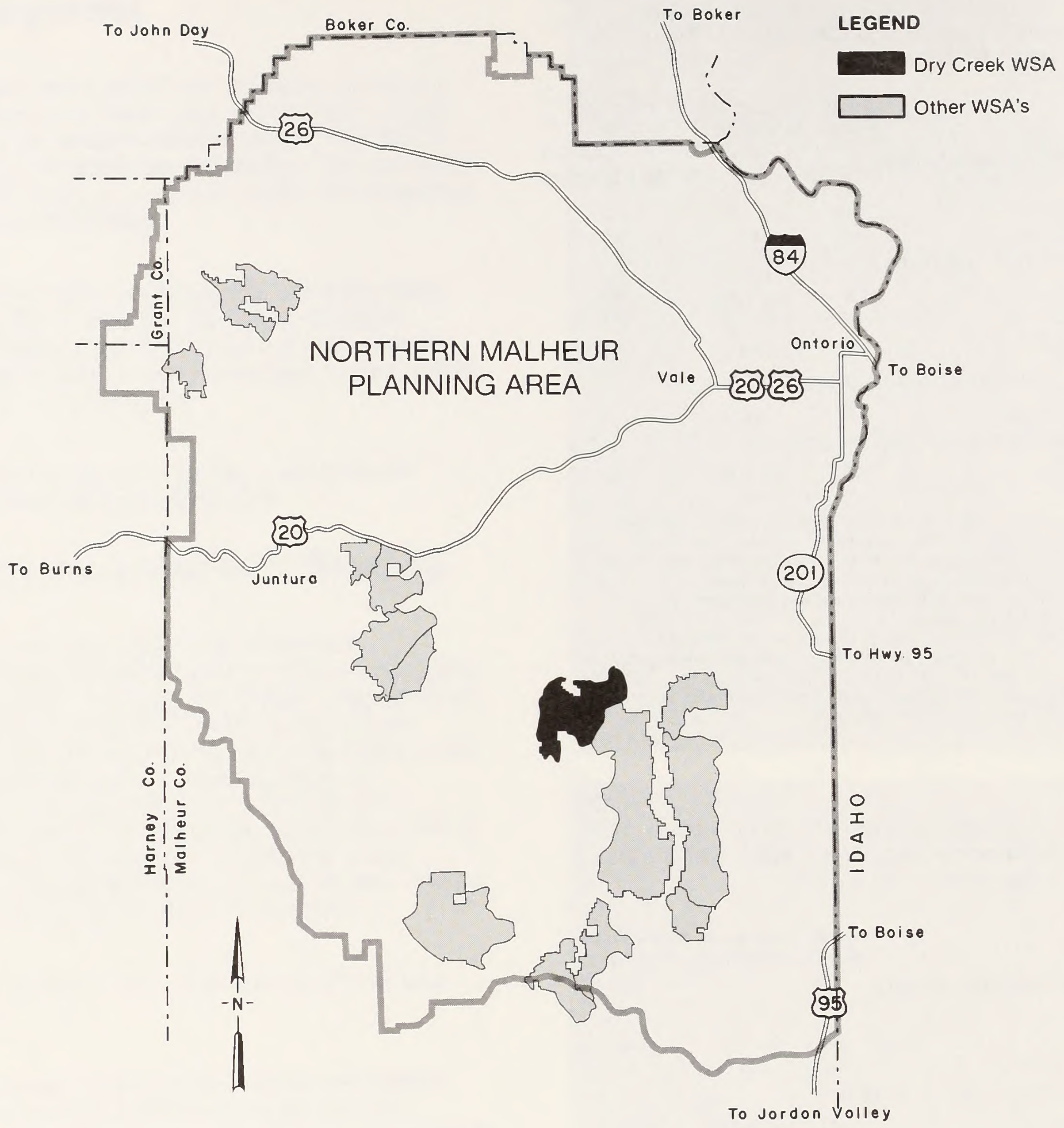
Item	Unit of Measure	Enhanced and All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +40	+40
Oil and Gas Leases	Acres	-90	0
INCOME FROM PROPOSED INVESTMENTS [2]			
Grazing	$	0 to +643	+643
Construction Activity [3]	$	0 to +1,734	+1,734
Total [4]	$	0 to +643	+643
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Oil and Gas Leases	$	-27	0
INCOME FROM ALL OUTPUT CHANGES			
All categories [4]	$	-27 to +616	+643

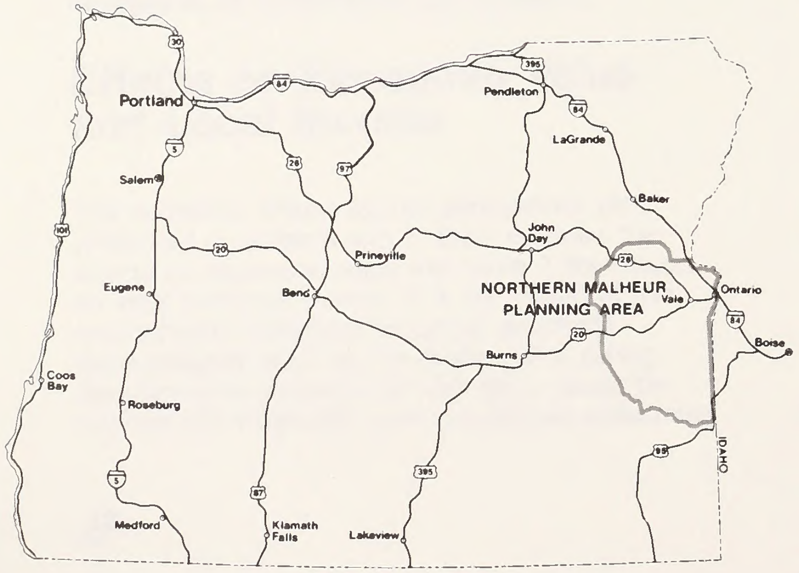
[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $12,599 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.





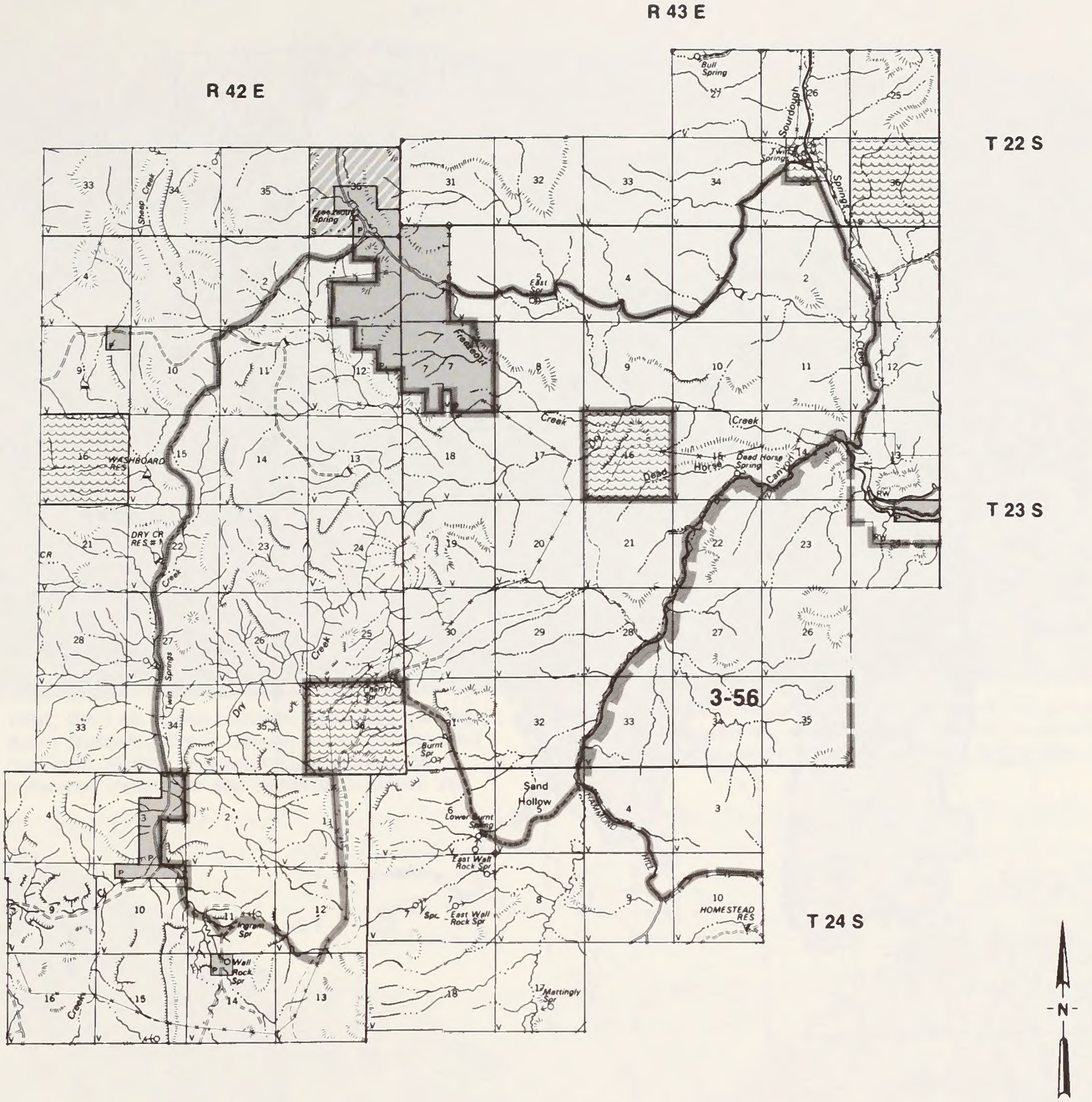
U.S. Department of the Interior
Bureau of Land Management
Vale District

Dry Creek WSA
OR-3-53

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

– – Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ State

■ Private

≋ BLM Surface-State or Private Subsurface (Split Estate)

U.S. Department of the Interior
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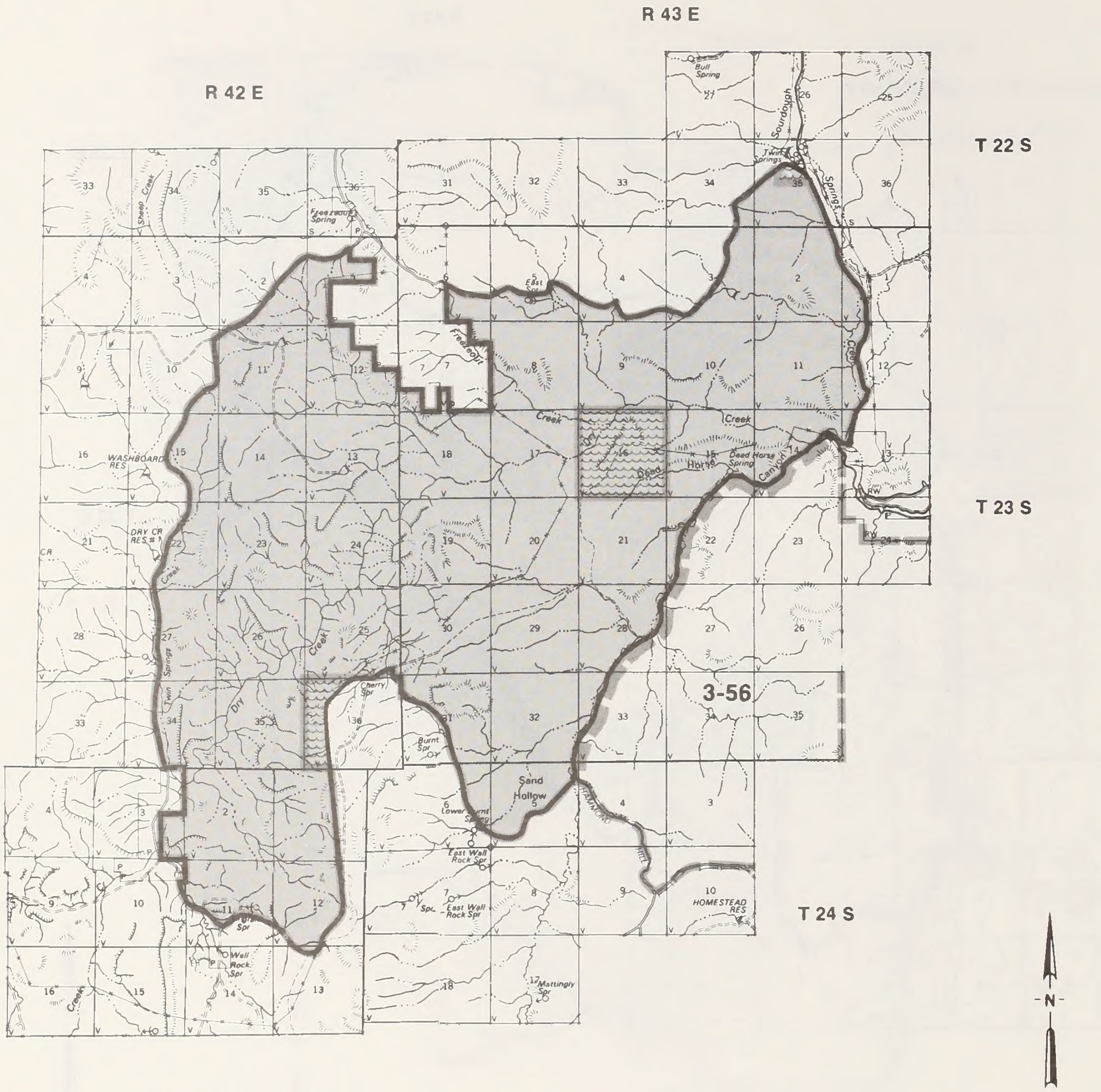
Vale District

Dry Creek WSA
OR-3-53

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

━ Wilderness Study Area Boundary

- - Boundary of Adjacent Wilderness Study Areas

▢ Recommended Suitable for Wilderness

▨ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

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Dry Creek WSA
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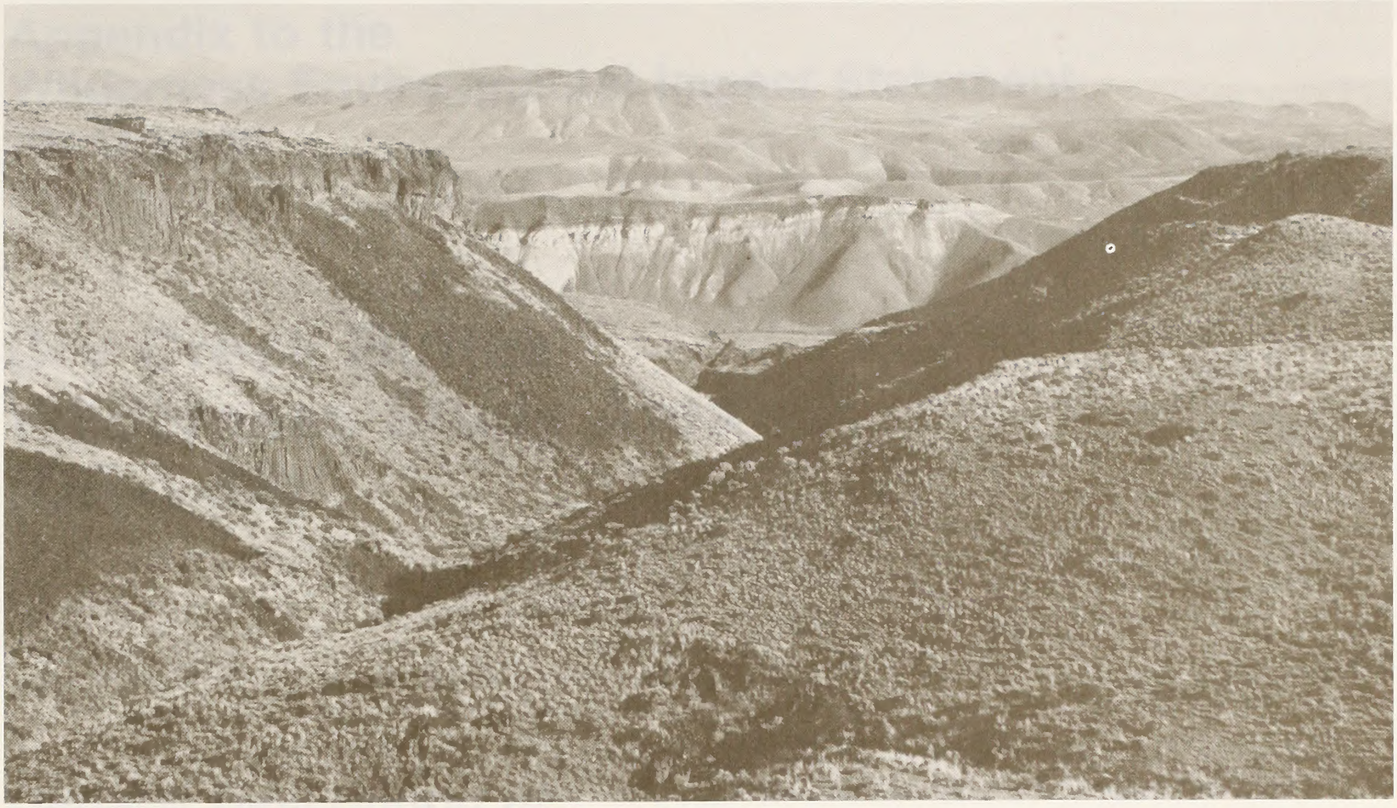
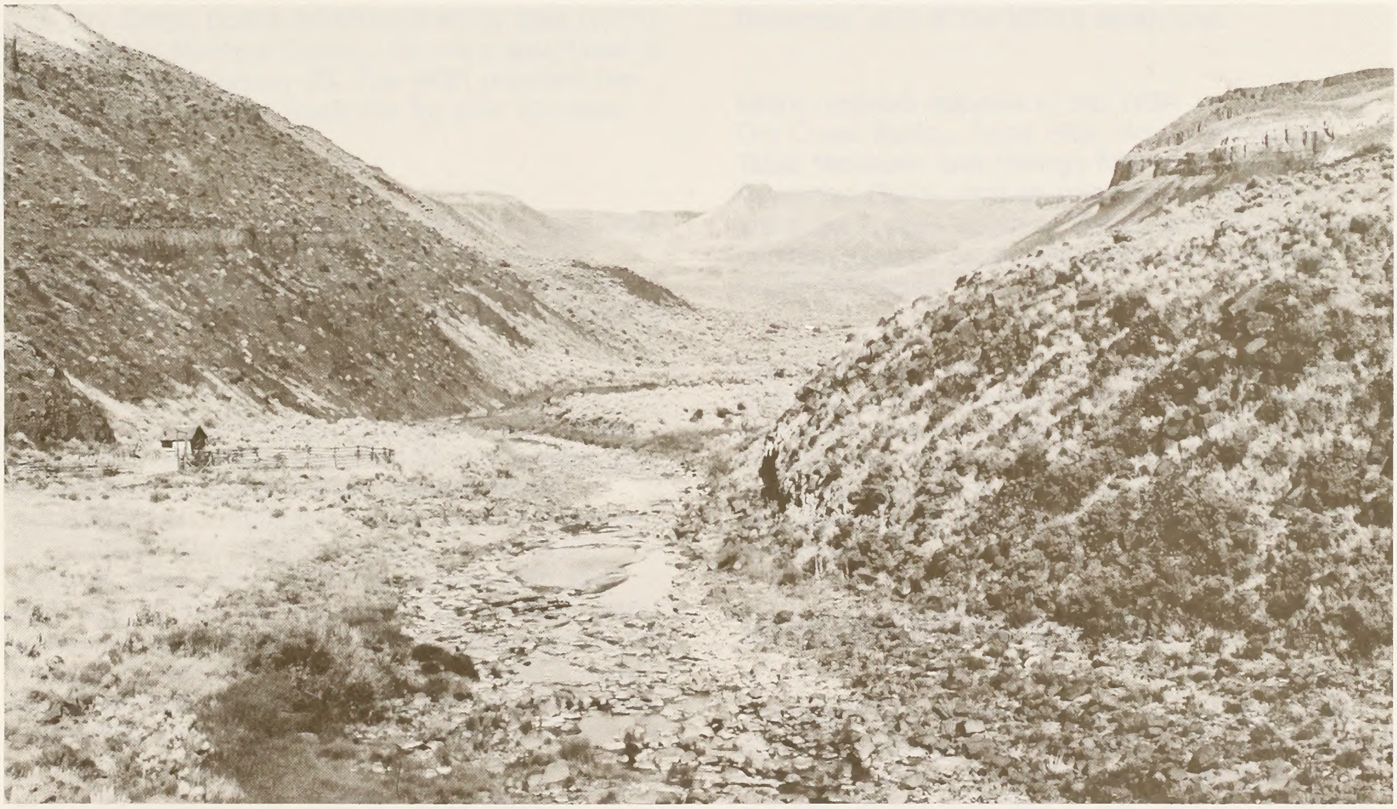
ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



Dry Creek WSA, OR-3-53. Along northern boundary looking southeast down Freezeout Creek Canyon (some private land shown on the right). Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. Dry Creek Canyon is visible in the middleground and Dry Creek Buttes WSA (OR-3-56) is visible along the horizon. September 1983.



Dry Creek WSA, OR-3-53. North central boundary area looking west up Dry Creek Canyon (cabin and corrals are not in the WSA). Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Dry Creek Buttes Wilderness Study Area (OR-3-56)

General Description of Study Area

The Dry Creek Buttes wilderness study area (WSA) is located in Malheur County, 30 miles southwest of Vale and U.S. Highway 20. The WSA parallels the west side of Owyhee Reservoir for over 20 miles (see map 1).

The WSA contains 49,880 acres of public land (see map 2). Within the WSA are 1,280 acres (two sections) of split-estate land (federally managed surface, state or privately owned subsurface mineral rights).

The northern and western boundaries are formed by approximately 23 miles of road and 2 miles of substantially noticeable ways (vehicle routes established and maintained solely by the passage of vehicles). Two dead-end roads, 1 mile each, enter the study area in the Sand Hills area and from part of the west boundary. The southern and eastern boundaries are formed by approximately 32 miles of Bureau of Reclamation lands and 2 miles of private land. A section (640 acres) of split-estate also forms part of the eastern boundary.

The WSA is a rugged area of varied terrain. Numerous gulches and ravines cut through the landscape, ultimately draining into Owyhee Reservoir. The result is a complex pattern of twisting drainages separated by hills and ridges of varying steepness and height. Rock outcrops and rimrock are scattered throughout the study area, but are especially prevalent along Owyhee Reservoir, and at the WSA's south end.

Major physical features in the WSA are Red Butte, Dry Creek Buttes, Sand Hills, North and South Table Mountain and Nannys Nipple. Acton Gulch, Deadman Gulch, and an unnamed 4-mile-long drainage 2 miles south of Deadman Gulch, which contains several small waterfalls, are the area's major drainages.

The WSA's southern section is much more rugged than the northern section. The landscape is more dissected, and the drainages are usually more incised. The highest concentration of pinnacles and rock outcroppings occur in the south. Typical vegetation in the WSA is sagebrush and bluebunch wheatgrass.

Interrelationships

The Dry Creek WSA (OR-3-53) is adjacent to the northwest boundary of this WSA for approximately 6 miles. The two WSAs are separated by a road. Located on the east side of the Owyhee Reservoir are three additional WSAs. Slocum Creek WSA (OR-3-75), Honeycombs WSA (OR-3-77A) and Wild Horse Basin WSA (OR-3-77B).

Adjacent to the WSA on the east and north is land managed by the Bureau of Reclamation in conjunction with its administration of Owyhee Reservoir. Numerous recreational cabins on leased sites are located on this adjacent land. The cabins to the east are reached by boat only. These cabins are located on both sides of the Owyhee Reservoir along a 12-mile stretch and are generally within 1 1/2 miles of the WSA boundary.

The State of Oregon Aeronautics Division maintains an airstrip near the mouth of Deadman Gulch, just outside the WSA's east-central boundary and adjacent to the Owyhee River. The Division intends to maintain the airstrip, which would involve improvement and use of the way across the WSA down Deadman Gulch. The way currently is not maintained. The Division believes that barging equipment to the airstrip via the reservoir is not practicable.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- access by motorized vehicles to the Pelican Point airstrip for maintenance purposes,

- access to and development of the split-estate inholdings,

- development of existing and potential mineral rights, and

- existing livestock grazing and two proposed livestock reservoirs in the WSA.

Also raised as an issue was combination of this WSA with adjacent and nearby WSAs (OR-3-53, former 3-74, 3-75, 3-77A, and 3-77B) into one wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (preferred alternative)

An alternative which would combine this WSA with the adjacent Dry Creek WSA and the three WSAs across the reservoir is not analyzed. The Dry Creek Buttes WSA is separated from the adjacent Dry Creek WSA by a major road and from the nearby other 3 WSAs by the Owyhee Reservoir. It would not be feasible to close this major road, since it provides the primary access to a large area west of the Owyhee Reservoir. The reservoir is managed by the Bureau of Reclamation and is not subject to wilderness consideration.

An enhanced wilderness alternative, which would designate all of the WSA and propose to acquire the two parcels of split-estate inholdings is not analyzed because the impacts are not significantly different from those analyzed in the all wilderness alternative.

A partial alternative is not analyzed because the conflict with mineral potential, which is the only major resource conflict, could not be resolved by recommending a portion of the WSA suitable as wilderness.

All Wilderness

Under the all wilderness alternative, all 49,880 acres of public land in the WSA would be recommended suitable as wilderness (see map 2).

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- construction of proposed livestock improvement projects, including 2 reservoirs,

- continued closure to vehicles of 16,960 acres in the southern half of the WSA and continued restriction of vehicles to existing routes on the remainder of the WSA,

- continued availability for mineral exploration and development, and

- periodic maintenance of the vehicle access to the State of Oregon's Pelican Point airstrip.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area recommended suitable under the all wilderness alternative would be manageable as wilderness.

Factors that could affect manageability include three parcels (1,920 acres) of split-estate land (two within the WSA and one adjacent), and numerous mining claims in the WSA. Development of the nonfederal subsurface mineral estate could result in construction of several miles of access roads, structures, pits, holding ponds, and mine tailing dumps. There is presently no mineral development or vehicle access to these areas.

Table 1. Summary of Proposed Management Under Each Alternative, Dry Creek Buttes WSA (OR-3-56)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	49,880	0
Acres Closed to ORVs by Wilderness Designation [1]	32,920	0
Miles of Ways Closed	8	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	49,880	0
Structural Livestock Projects Developed: Reservoirs & Waterholes (number)	0-2	2

[1] Under the current land use plan, 16,960 acres of the WSA are already closed to vehicle use.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because of the mineral potential within the WSA. The benefits of preserving the option of development of these minerals outweighs the benefits of preserving the area's wilderness values. The potential for gold and silver is rated high over a large portion of the WSA and moderate over the remainder. In addition, uranium, thorium, optical calcite, zeolites, bentonite, and oil and gas are rated moderate for the entire WSA.

This alternative also allows improvement and maintenance of the vehicular access down Deadman Gulch to the Pelican Point airstrip, and also allows motorized recreation and construction of two new livestock watering reservoirs.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Dry Creek Buttes WSA is generally natural because man-made features are substantially unnoticeable, both individually and cumulatively.

Fifteen interior man-made features influence approximately 7 percent of the WSA. (The area of influence is an estimate of the acreage within the WSA from which the man-made features can be seen.) These man-made features are 2 fences totaling 4 miles, a reservoir, 2 guzzlers (small wildlife watering devices), 2 old abandoned horsetraps, a corral, a rock wall segment, 2 sheepherder monuments and several ways totaling 8 miles.

The WSA is bisected by a way through Deadman Gulch. Two-thirds of the man-made features in the WSA occur north of this way. The features in the north generally occur on flat or rolling terrain and can be seen for some distance. The developments in the southern section are better hidden because of the more rugged and diverse terrain; therefore they are less noticeable and generally influence

Table 2. Summary of Environmental Consequences, Dry Creek Buttes WSA (OR-3-56)

	All Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 49,880 acres to NWPS. Maintains wilderness characteristics, including varied geologic formations, areas of relatively undisturbed vegetation, plant species of special interest, potential bighorn sheep habitat, reptile habitat, bald eagle wintering grounds, paleontological values, and outstanding scenery. Closure of 8 miles of ways would enhance wilderness values and special wilderness features. Possible localized adverse impact on wilderness characteristics due to mineral development of split estate or valid mining claims (if there were any in the area). The area would be manageable as wilderness.	Wilderness characteristics would be adversely affected by possible mineral exploration and development activities. Maintenance of route down Deadman Gulch would have minor impact on wilderness values.
Energy and Mineral Development	Development precluded on 49,880 acres, including 49,880 acres with moderate potential for oil and gas, bentonite, zeolites, and optical calcite; 9,400 acres with moderate potential for uranium; 31,556 acres with moderate potential for gold and silver; and 18,324 acres with high potential for gold and silver.	No impact.
Livestock Grazing	Increase of 100 AUMs and better livestock distribution might be foregone if proposed reservoirs are not allowed.	Construction of two reservoirs would result in better livestock distribution and an increase of 100 AUMs.
Economic Value and Local Income	Decrease in annual economic value could range from $7,211 to $7,230 depending on what proposed projects would be allowed in wilderness. Decrease in local personal income could range from $560 to $2,168, depending on the same uncertain factors. Both sets of figures include loss of oil and gas leases, and exclude unknown economic effects of mineral development and unquantified changes in recreation use.	Decrease in economic value by $19 and increase in local personal income by $1,608 from construction of all proposed projects.

fewer acres than the developments in the northern portion.

The sight of the recreational cabins outside the area and the sounds of activities at the cabins affect the WSA's naturalness more than any other developments outside the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the WSA are outstanding, primarily because of the rugged and diverse topography. The variety of terrain divides the study area into three portions: incised "badlands" in the south; hilly terrain with a series of broken ridges and drainages in the north; and gently rolling to flat landscape in the Sand Hills area in the west. Of the three, the Sand Hills is the only portion without good topographic screening. The southern portion provides the most topographic screening and offers the greatest number of secluded locations.

The WSA's relatively large size and numerous travel corridors help to disperse use and contribute substantially to outstanding opportunities for solitude. Although scenic and geologic attractions might concentrate users in the southern portion of the WSA, this section contains rugged terrain with abundant topographic screening. The area has little vegetative screening.

Because of its large size and geologic features, the WSA provides a challenging setting for primitive and unconfined recreation. Day hiking, backpacking, photography, and sight seeing opportunities are outstanding. There are also opportunities for hunting, horseback riding, and bird watching.

Special Features

Special wilderness features in the Dry Creek Buttes WSA include the Deer Butte Formation which is an excellent example of sandstone and shale strata. Other geologic formations and landmarks found within the WSA include Rooster Comb, Red Butte and Sand Hills.

Two plant species in the WSA are of special interest: *Astragalus solitarius* (weak milkvetch) and *Astragalus sterilis*. (The Vegetation section further discusses these plants.)

Another plant found in the WSA is a newly discovered undescribed Penstemon species proposed to be named *Penstemon nikei*.

Potential bighorn sheep habitat and excellent reptilian habitat are other special wilderness features in the area. Northern bald eagles (federally listed as threatened in Oregon) winter on the Owyhee Reservoir (see the Wildlife section for more information.)

The southern portion of the WSA offers outstanding scenery due mainly to the interesting variety of land forms and vivid color combinations.

Cultural values are present within the WSA. (See the Cultural Resources section for more information.)

There are opportunities for educational and scientific study of the area's geology, wildlife, and unique ecological interrelationships. Talus slope and rock outcrops offer shelter to small animals, while birds use cliffs and spires for roosts and nesting sites. Cracks and cavities may harbor bats and other animals. Clay cliffs and tuffaceous ash deposits found north and west of Red Butte could have unique soil properties favoring unusual plant species.

Vegetation on the tops of the larger buttes and mesas (Red Butte and North and South Table Mountain) is nearly pristine because the steep slopes and rimrocks make the tops nearly inaccessible to livestock.

Diversity in the National Wilderness Preservation System

According to the Bailey-Küchler system of classifying ecosystems, the WSA is located in the Intermountain Sagebrush Province and the potential natural vegetation is sagebrush steppe. The WSA contains two vegetative communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan: big sagebrush/bluebunch wheatgrass and alkaline vegetative mosaic with representative communities including greasewood, shadscale, saltgrass and hopsage types.

Boise, Idaho is the only standard metropolitan statistical area with population over 100,000 within 5 hours' driving time of the WSA.

Energy and Mineral Development

The energy and mineral resources of the Dry Creek Buttes WSA were evaluated from available geologic data supplemented by a limited amount of reconnaissance geochemical stream sediment and rock chip sampling by the Oregon Department of Geology and Mineral Industries (DOGAMI) under a BLM contract. This geochemical survey is the basis for the metallic minerals classification in the WSA. The DOGAMI report is entitled "Geology and Mineral Resources of 18 BLM Wilderness Study Areas, Harney and Malheur Counties, Oregon". Using the DOGAMI report and heavy mineral data submitted by Barringer Resources, Inc., the study area was reevaluated by BLM personnel.

The area has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

A portion of the WSA is rated highly favorable for occurrence of gold and silver with the remainder of the WSA rated moderate for these metals. The entire WSA is rated moderately favorable for oil and gas, bentonite, zeolite, and optical calcite. A portion of the WSA is rated moderately favorable for uranium.

The mineral potential classifications for the WSA are shown in table 3. Map 4 shows the portion of the WSA rated high for gold and silver and

Table 3. Classification of Energy and Mineral Potential, Dry Creek Buttes WSA (OR-3-56)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, silver)	See map 4	4	C
	Part of WSA	3	B
	Part of WSA	3	C
Geothermal	Entire WSA	2	B
Uranium	See map 4	3	B
	Rest of WSA	1	A
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	2	B
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	3	B
Diatomite	Entire WSA	2	B
Zeolites	Entire WSA	3	C
Optical Calcite	Entire WSA	3	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

moderate (medium) for uranium.

Oil and gas is the main potential energy resource in the study area. Oil and gas potential will largely depend on the presence or absence of suitable marine rocks at depth. There has been no deep drilling in the vicinity that has penetrated the Tertiary volcanic cover.

As of January 1, 1984, there were three oil and gas leases covering 7,200 acres and 190 mining claims in the WSA. There were no geothermal leases in the WSA. The mining claims are located in the southwestern quarter of the WSA and are associated with gold and silver. Silver is a strategic and critical mineral.

All of the exposed rocks within the area are Miocene or younger and include lacustrine (lake) and fluvial (stream) deposits (poorly to moderately well consolidated, bedded silicic ash and pumice, diatomite and minor mudflow deposits). It is not known what underlies these rocks at depth. All of these rocks were deposited in a broad north-plunging basin or basins that evolved in eastern Oregon and western Idaho beginning in the late Miocene.

Vegetation

Vegetation throughout the WSA is a sagebrush steppe ecosystem, and is predominantly in the mid-seral stage. (Seral refers to the stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The climax vegetation is bluebunch wheatgrass/Wyoming big sagebrush community.

Pristine vegetation which is either ungrazed or has been very lightly grazed occurs on isolated mesa tops such as North and South Table Mountain and Red Butte. Two plant species of special interest (mentioned in the Special Features section) which are found in the WSA are *Astragalus solitarius* (weak milk vetch) and *Astragalus sterilis*, (sterile mile vetch). These are candidate species for federal listing as threatened or endangered.

Penstemon nikei, a newly discovered undescribed species, is found south of Dead Horse Spring.

Wildlife

Mule deer use much of the area throughout the year. A small band of antelope use most of the WSA yearlong and tend to concentrate during the winter in the southwestern portion. The area is historical California bighorn sheep range, though no sheep occupy the WSA at present. Sheep could be reintroduced, although this area has been given a low priority by the Oregon Department of Fish and Wildlife for reintroduction in Malheur County.

Cliffs, spires and rimrock areas are attractive to birds of prey and a variety of nongame species. Small communities of common rodents, carnivores and fur bearers typical of the intermountain region occur throughout the area. Upland game birds common in the area include partridge, California quail and mourning doves. Northern bald eagles pass through the area in their annual spring and fall migrations. Some birds winter on the Owyhee Reservoir as long as open water persists. Twenty to thirty eagles utilize the Owyhee River and Reservoir.

Notable reptiles utilizing the excellent habitat in the WSA include leopard, western fence, northerside blotched uta, sagebrush, western whiptail, desert and collared lizards and western ground Great Basin rattler, gopher, yellow bellied racer, striped whip and desert night snakes.

Livestock Grazing

Portions of two grazing allotments are located within the WSA. Table 4 summarizes existing and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Existing range projects (among the man-made features mentioned in the Naturalness section) include one reservoir, one corral and two fences.

Construction of 2 livestock reservoirs is proposed in the northern part of the WSA. The reservoirs would assist in achieving more complete livestock distribution within the allotment and would increase licensed livestock forage in the WSA and the allotment by 100 AUMs.

Vehicles are presently used by livestock operators in the WSA to place salt, check livestock, and maintain the existing reservoir. Horses are used to move cattle to and from the area.

Paleontological Resources

Thirty-six species of fossilized mammals dating to the Late Miocene (Hemphillian Stage) were found in 1960 and 1961. Species found included rabbit, horse, bear, camel, and antelope.

Three paleontological sites are located in the southwest portion of the WSA; six others are immediately adjacent to the WSA.

Recreation Use

Most recreation occurs during deer and chukar hunting seasons and summer boating and fishing seasons. Most of the recreation use is not vehicle-oriented. Vehicle use in the northern area is restricted to the few existing roads and trails, and the southern area is closed to motor vehicles.

Table 4. Existing and Potential Livestock Use, Dry Creek Buttes WSA (OR-3-56)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot.in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Wallrock (No. 0405)	8,546	11/01-05/31	7	613	100
Quartz Mountain (No. 0406)	5,586	11/01-03/01	29	1,628	0
Totals	14,132			2,241	100

[1] Increase might or might not result in increased licensed use in the allotment (see narrative).

A considerable amount of primitive recreation use is associated with fishing, boating and the resort cabins use on the Owyhee Reservoir, which bring people into the area who take advantage of the WSA's primitive recreation opportunities. There is also some rockhounding occurring in the WSA.

Economic Value and Local Income

Livestock grazing, oil and gas leasing, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 3 oil and gas leases and no geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Dry Creek Buttes WSA (OR-3-56) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	2,241	$16,897	$36,035
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil & Gas Leases	Acres	7,200	7,200	2,168
Total			24,097	38,203

Effects on Wilderness Values

The **all wilderness alternative** would add 49,880 acres to the National Wilderness Preservation System (NWPS). It would preserve the area's rugged terrain, varied geologic formations, areas of relatively undisturbed vegetation, plant species of special interest, potential bighorn sheep habitat, reptile habitat, bald eagle wintering grounds, paleontological values, and outstanding scenery.

Surface disturbance resulting from development of minerals on the split-estate sections could adversely affect the WSA. If valid mining claims were established by the discovery of a valuable mineral before wilderness designation, mineral development on the claims could also adversely affect wilderness values. Mineral development would especially impact the naturalness of the area, but other wilderness values and special wilderness features could also be affected. The potential for mineral development is moderate to high.

Closure of the 8 miles of ways would allow the ways to revegetate, enhancing the naturalness of the area. Elimination or restriction of vehicle use also would improve opportunities for solitude and primitive recreation. The impassable route down Deadman Gulch would continue to erode and revegetate, becoming less of an influence upon the area's naturalness.

Special features would benefit from wilderness designation by being protected from disturbance due to development. The absence of vehicles and mineral activity (with the possible exception of valid claims and activities on split-estate lands) would prevent damage to the geologic formations, the highly erodable badlands, and other special geologic features. Also protected would be the pristine native vegetation on the mesa tops and steep slopes, plants of special interest, potential bighorn sheep habitat, and the paleontological sites. The exclusion of surface disturbing activities would also preserve the outstanding scenery in the southern portion of the WSA.

Under the **no wilderness/no action alternative**, mineral development would adversely affect wilderness values, including the area's special wilderness features and opportunities for solitude and primitive recreation.

Wilderness values also could be adversely affected by access to the split-estate inholdings. Use of the route down Deadman Gulch every 9 years to maintain the airstrip would require opening and improving the route so mechanized equipment (probably a road grader, small bulldozer and pickup) could be driven to the airstrip. Rehabilitation and closure of the route would restore the appearance of the canyon to its pre-maintenance condition by the following spring. Primitive recreation opportunities would be impaired only during the periods of maintenance (3 to 5 days every 9 years). Special wilderness features would not be impaired.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Table 6 shows the acres that would be withdrawn under each alternative, including the areas with high and moderate potential for minerals.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the two proposed livestock reservoirs might or might not be constructed, depending on a site specific analysis of whether they conform with Wilderness Management Policy. If they were not allowed, an opportunity to improve distribution of livestock and increase forage by 100 AUMs would be foregone.

The two stock reservoirs have a benefit/cost ratio of less than 1:1.

The use of motor vehicles by livestock operators on existing routes in the WSA could be allowed if there were no practical alternatives.

Under the **no action/no wilderness alternative**, the increase of 100 AUMs and the better distribution of livestock would be realized.

Table 6. Effects of Alternatives on Mineral Development, Dry Creek Buttes WSA (OR-3-56)

	Acres Withdrawn	
	All Wilderness	No Wilderness/ No Action
Total acres	49,880	0
Oil and gas rated moderate	49,880	0
Gold and silver rated high	18,324	0
Gold and silver rated moderate	31,556	0
Uranium rated moderate	9,400	0
Bentonite, zeolite, and optical calciterated moderate	49,880	0

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 7 and 8. Table 7 shows the effects on economic value and table 8, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the 2 reservoirs proposed for this WSA, would be constructed if the area were designated wilderness.

The column for the all wilderness alternative shows the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access were allowed.

Currently there is little dependence on vehicles for livestock management in the study area. The **all wilderness alternative** would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $11 per year.

Table 7. Effects of Alternatives on Annual Economic Value, Dry Creek Buttes WSA (OR-3-56) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +100	+100
Oil and Gas leases	Acres	-7,200	0
VALUE OF PLANNED INVESTMENTS [2]			
Grazing:	$	0 to +754	+754
Investments [3]	$	0 to -773	-773
Net Economic Value [4]	$	-19 to 0	-19
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Oil and Gas Leases	$	-7,200	0
Reduced access [5]	$	-11	0
Total	$	-7,211	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-7,230 to -7,211	-19

[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $9,600 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Average annual cost of investment expenditures amortized at 7.875% over M50-year period.

[4] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Closure of the way to Pelican Point airstrip could cause economic loss because less economical options for maintenance access might be chosen, or maintenance may be abandoned. These losses have not been estimated.

Table 8. Effects of Alternatives on Local Personal Income, Dry Creek Buttes WSA (OR-3-56) (1981 price levels)

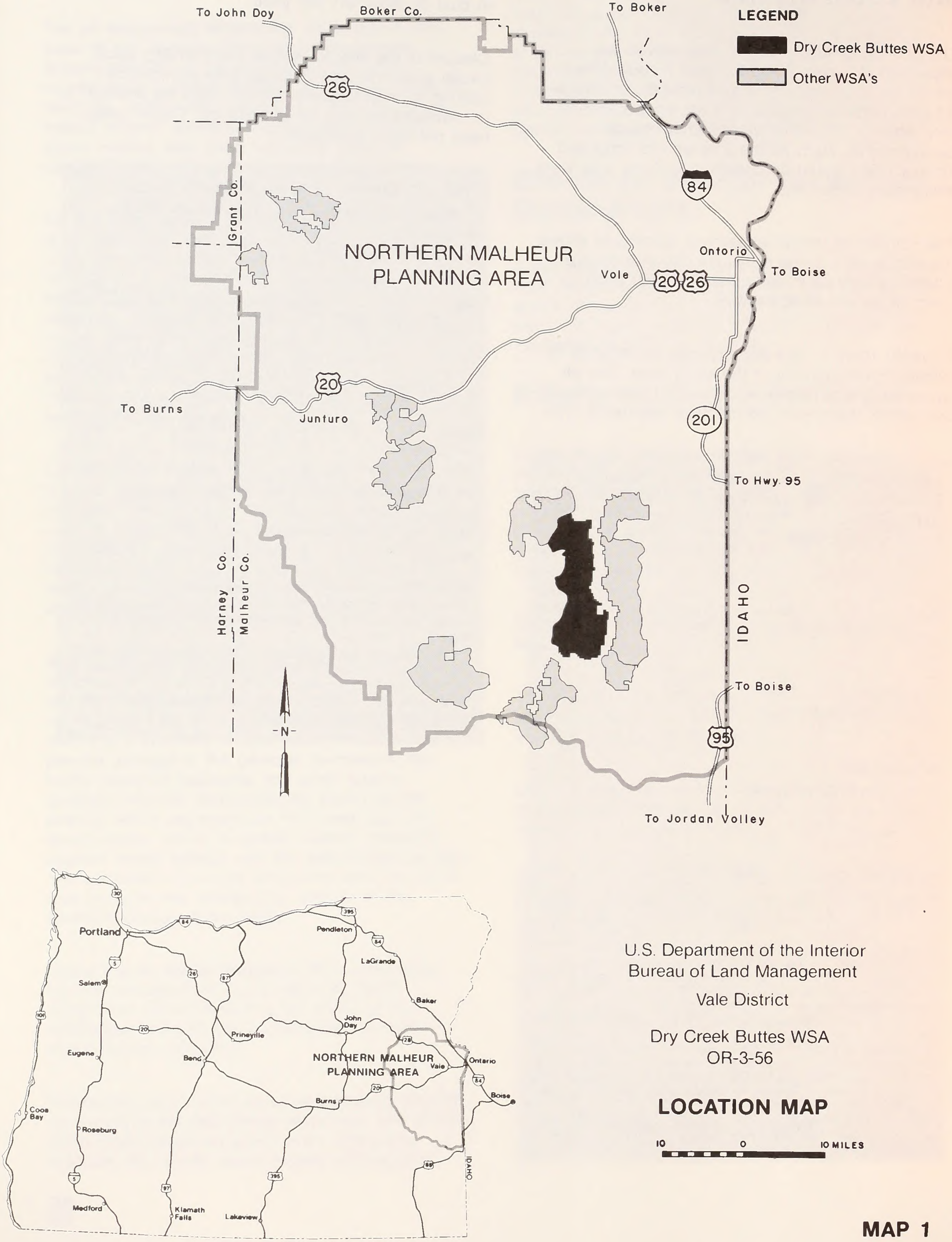
Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +100	+100
Oil and Gas leases	Acres	-7,200	0
INCOME FROM PROPOSED INVESTMENTS [2]			
Grazing:	$	0 to +1,608	+1,608
Construction Activity [3]	$	0 to +1,321	+1,321
Total [4]	$	0 to +1,608	+1,608
INCOME FROM OTHER EXPECTED OUTPUTS CHANGES			
Oil and Gas Leases	$	-2,168	0
INCOME FROM ALL OUTPUT CHANGES			
All categories [4]	$	-2,168 to -560	+1,608

[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $9,600 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.

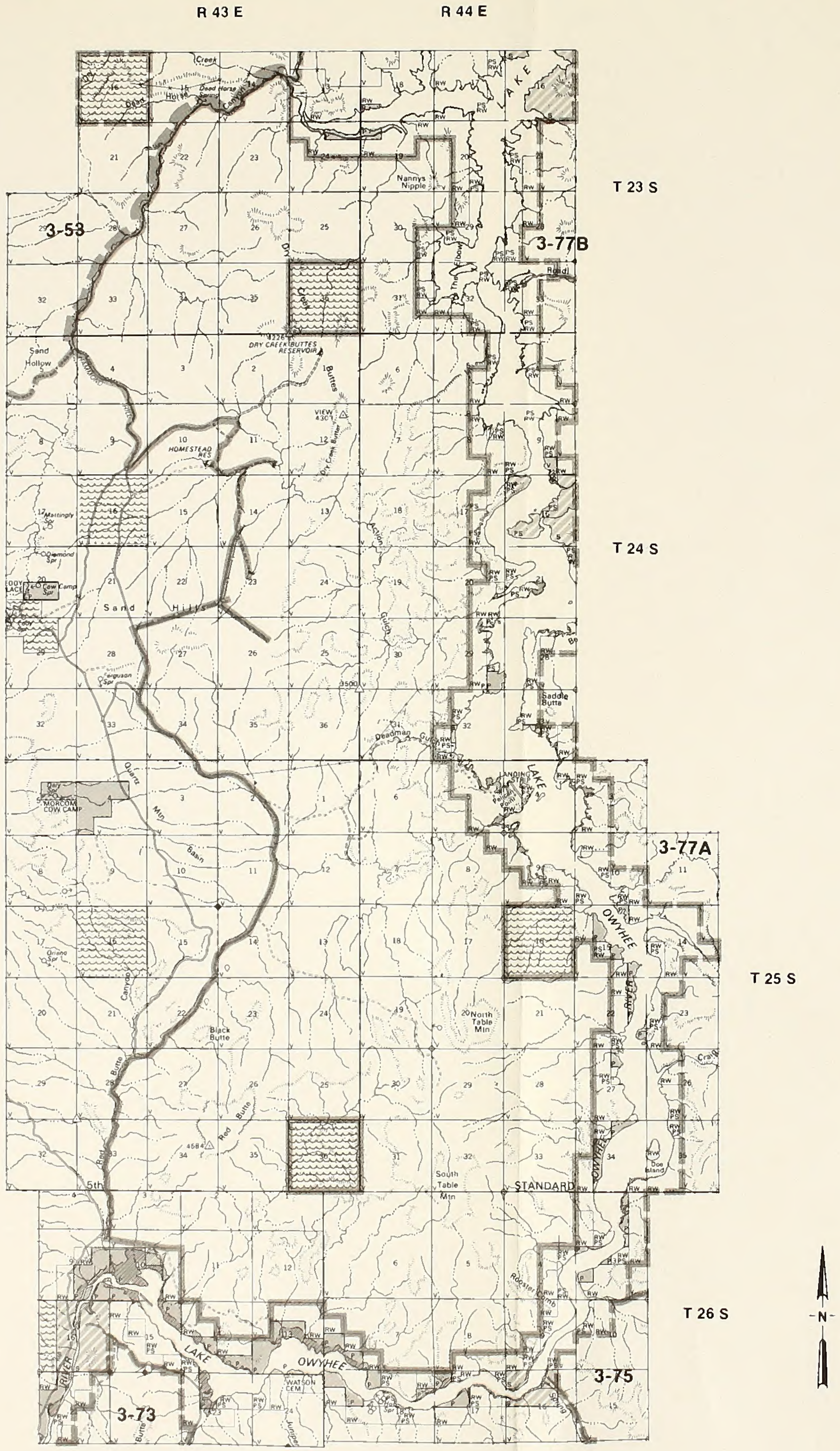


U.S. Department of the Interior
Bureau of Land Management
Vale District

Dry Creek Buttes WSA
OR-3-56

LOCATION MAP

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

╌ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ State

■ Private

▤ BLM Surface-State or Private Subsurface
(Split Estate)

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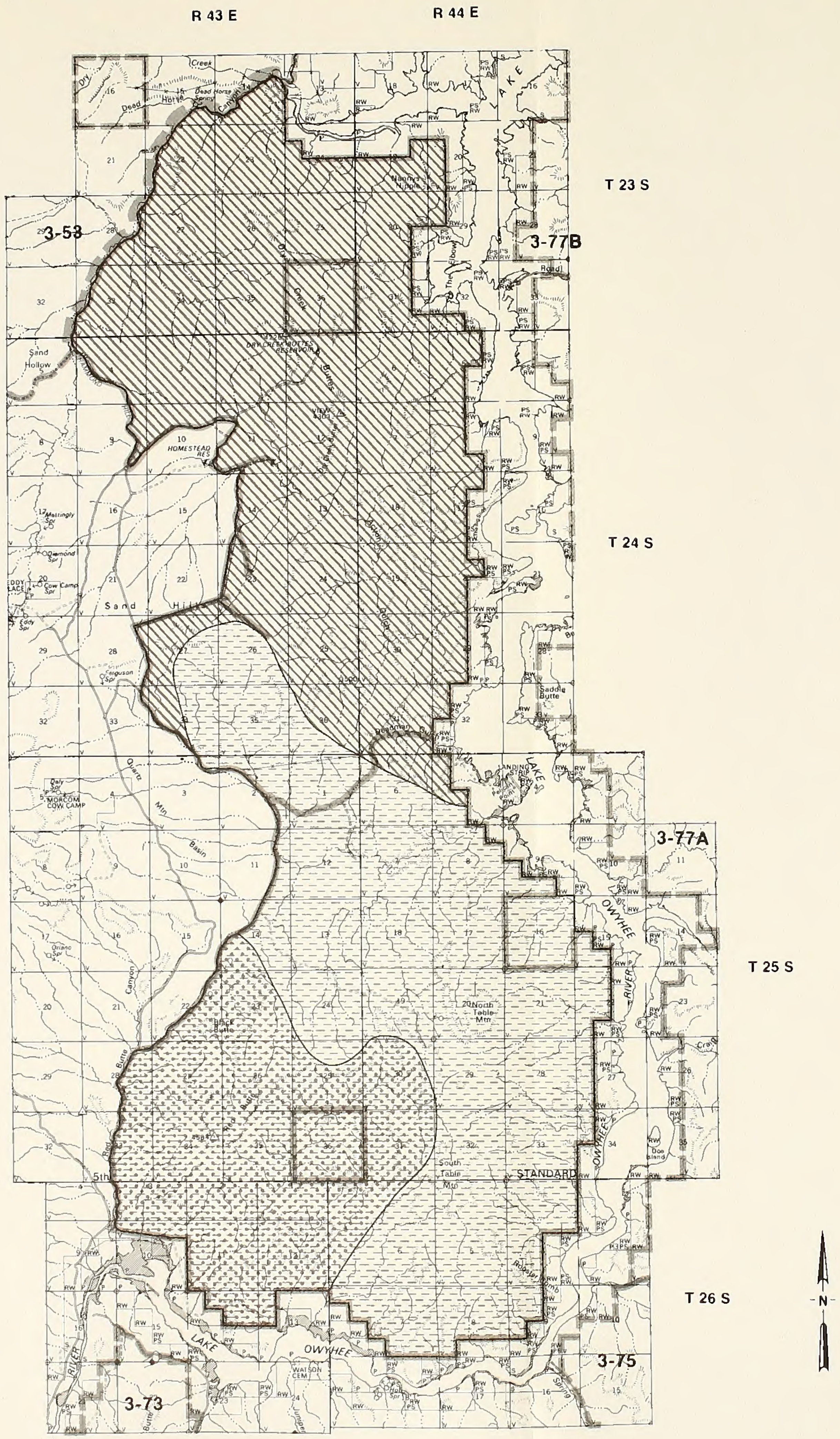
Dry Creek Buttes WSA
OR-3-56

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▨ **Medium Potential**
(3C) for Gold and Silver

▤ **High Potential**
(4C) for Gold and Silver

░ **Medium Potential**
(3B) for Uranium

Entire WSA:
Medium Potential
(3B) for Oil and Gas and Bentonite
(3C) for Zeolites and Optical Calcite

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Dry Creek Buttes WSA
OR-3-56

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 3

Dry Creek Buttes WSA, OR-3-56. Southeastern portion of WSA looking north across the "Badlands" toward South Table Mountain. Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Dry Creek Buttes WSA, OR-3-56. Southwestern portion of WSA looking northeast toward Red Butte. Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. July 1983.

Dry Creek Buttes WSA, OR-3-56. North-central portion of WSA looking northwest at basin between Dry Creek Buttes (some land from center to upper right is split-estate land). Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. Dry Creek Reservoir is near the center of the photo. September 1983.

Dry Creek Buttes WSA, OR-3-56. East-central portion of WSA looking west up Deadman Gulch. Area in foreground including road cuts are not within the WSA. Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. Way going up Deadman Gulch is not passable by vehicle. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Owyhee Breaks Wilderness Study Area (OR-3-59)

General Description of Study Area

The Owyhee Breaks wilderness study area (WSA) is located in Malheur County, approximately 24 miles northwest of Jordan Valley and U.S. Highway 95 (see map 1).

The study area is roughly oval shaped. It is approximately seven miles long and from two to six miles wide. It contains 13,100 acres of public land (see map 2). There are also six parcels of private property totaling 360 acres within the WSA (five 40-acre parcels and one 160-acre parcel). The 160-acre parcel spans the Owyhee River near the center of the WSA. The smaller parcels are scattered in the north.

The study area is bordered on the south and southeast by county roads, on the northwest by a BLM road and private property, and on the northeast by private property and public land administered by the Bureau of Reclamation. A portion of the study area's southwest corner also borders private property. Eight parcels of private land adjoin the WSA.

The Owyhee River bisects the area. The northern and central portions of the WSA area are characterized by steep bluffs, outcrops, cliffs, canyons, twisting gulches and ridgelines. The southern quarter of the WSA is characterized by open rolling hills, and a high plateau. The Owyhee River Canyon reaches a depth of 1,740 feet in the WSA.

The most common plants in the WSA are sagebrush and grasses. Scattered junipers and chokecherry are found along Birch Creek and the Owyhee River. Some drainages also harbor willows, alders, and currants.

Interrelationships

The Owyhee Breaks WSA is adjacent to Blue Canyon WSA (OR-3-73) on the northeast, Jordan Craters WSA (OR-3-128) on the southeast, and Lower Owyhee Canyon WSA (OR-3-110) on the west. All four adjoining WSAs are separated by roads.

About 660 acres of the Jordan Craters Research Natural Area (RNA) and Area of Critical Environmental Concern (ACEC) are located in the southeast portion of the WSA (see map 3).

The river corridor from rim to rim along the Owyhee River in the WSA is included in the Owyhee River Area of Critical Environmental Concern (ACEC). Management of the Owyhee River ACEC includes the following:

- limiting ORV use to designated roads and trails;

- erecting barriers and signs to deter ORV use and protect the fragile habitat;

- continuing river patrols during high use to monitor and prevent over use which may damage the sensitive values; and

- conducting studies of river carrying capacity and then regulating river use to prevent damage to sensitive plants, fish and wildlife habitat.

The portion of the Owyhee River flowing through the WSA is part of a 50-mile segment of the river that has been designated a wild river component of the National Wild and Scenic Rivers System. The federal designation withdraws from mineral location and leasing all public lands within 1/4 mile on each side of the river (2,240 acres in the WSA). Most of this stretch of river (all of it within the WSA) is also an Oregon State Scenic Waterway. The state designation provides some state control over private land use changes within 1/4 mile of the stream, which affects the private lands inside the WSA.

The restrictions for the RNA, ACEC and the wild and scenic river designation would continue to apply within the WSA whether or not the area is designated wilderness.

This WSA is also bordered on the northeast by about 1,750 acres of land managed by the Bureau of Reclamation in connection with their management of Owyhee Reservoir.

A portion of the land along the Owyhee River is part of a power site reserve, which earmarks the land for potential water power and water storage development. This "withdrawal" will be reviewed because of the wild river designation, which may lead to its revocation. Power site development is not foreseen, and therefore not discussed further.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- private land inholdings (the effects of wilderness designation on private lands are addressed in the Statewide EIS volume),

- outside man-made features,

- valid existing mineral rights in the area,

- the area's mineral potential, and

- public access easements.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

A partial alternative, which would recommend part of the area as suitable for wilderness, is not analyzed because there are no resource conflicts that could be resolved by eliminating a portion of the WSA as nonsuitable. An alternative which would combine this WSA with adjacent WSAs is not analyzed because the roads separating them are needed for access to private property.

All Wilderness

Under the all wilderness alternative, all 13,100 acres of public land in the WSA would be recommended suitable as wilderness (see map 2). For purposes of analysis, it is assumed the six parcels (360 acres) of private property would not be acquired.

Enhanced Wilderness

The enhanced wilderness alternative would recommend all 13,100 acres of public land in the WSA suitable as wilderness (see map 4). In addition, an attempt would be made to acquire the 360 acres of private inholdings, through purchase or exchange with willing land owners. Also, an attempt would be made to acquire public access easements across adjacent private property.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features, in addition to ACEC constraints, relevant to this analysis:

- continued availability for mineral exploration and development, except for the 2,240 acres withdrawn 1/4 mile back from each side of the river, and

- continued restriction of off-road vehicle (ORV) use to existing routes outside the ACEC.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area could be managed as wilderness under the all wilderness alternative, if private lands within and adjacent to the WSA and mining claims in the area were not developed. The area could be better managed under the enhanced wilderness alternative.

Table 1. Summary of Proposed Management Under Each Alternative,Owyhee Breaks WSA (OR-3-59)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	13,100	13,100	0
Acres Closed to ORVs by Wilderness Designation	13,100	13,100	0
Miles of Ways Closed	4	4	0
Acres of Full Fee Estate Acquired[1]	0	360	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation [2]	10,860	10,860	0

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[2] A total of 2,240 acres in the WSA are already withdrawn from mineral location and leasing through Congressional designation of the area as a Wild and Scenic River.

Private lands are scattered across the northern part of the WSA, and if they were developed and access were constructed to them, it could adversely affect a significant portion of the WSA. The lands are now used in the same manner as surrounding public lands, but that could change at the owner's discretion.

If claimants discovered a valuable mineral deposit on the seven mining claims in the east-central part of the WSA before the area was designated wilderness, the claims could be mined, regardless of the effect on wilderness values. Developments on the Birch Creek and Hole-in-the-Ground ranches, located next to the WSA, can be seen from within the WSA, and additional developments on the ranches could further detract from the area's wilderness values.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits to be gained from wilderness designation would be limited by the difficulties in managing the area and would be outweighed by the benefits of retaining options for development of energy and mineral resources outside the 2,240-acre area withdrawn along the river. The area has a moderate potential for the occurrence of geothermal resources, oil and gas, bentonite and zeolite, and a portion of the area has a moderate potential for the occurrence of silver, gold and mercury.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Owyhee Breaks WSA appears to be in an essentially natural condition when only developments inside the area are considered. The rugged terrain has limited the number of man-made features in the WSA, and the majority of these features are concentrated along the boundary of the study area.

Table 2. Summary of Environmental Consequences of Alternatives, Owyhee Breaks WSA (OR-3-59)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 13,100 acres to NWPS. Assure preservation of wilderness values, including outstanding opportunities for solitude and primitive recreation, outstanding scenery, important raptor nesting habitat, and riparian and aquatic habitat. Closing 4 miles of way would enhance wilderness values. Area would be manageable as wilderness, although management could be complicated if private inholdings were developed.	Would add 13,460 acres to NWPS, assuming 360 acres if private inholdings were acquired. Also would acquire public access easements on adjacent private land. Would provide better protection of wilderness values than all wilderness alternative. Area would be manageable as wilderness.	Wilderness values could be adversely affected by energy and mineral development, other resource development activities on public lands, and development of private lands.
Energy and Mineral Development	In addition to 2,240 acres already withdrawn by wild river designation, development would be precluded on 10,860 acres, including 10,860 acres with moderate potential for oil and gas, geothermal, bentonite and zeolites; 4,960 acres with moderate potential for mercury, gold and silver; and 280 acres with moderate potential for uranium/thorium.	Same as all wilderness, except development precluded on an additional 200 acres if the private inholdings are acquired.	No impact.
Economic Value and Local Income	The maximum increase in transportation costs to livestock operators would be $14.	Same as all wilderness.	No impact.

There are a total of 17 man-made features in the area: 7 ways (a vehicle route established and maintained solely by the passage of vehicles) totaling 4 miles, 3 reservoirs, 6 fences totaling 2 miles and a rock retaining wall. These man-made features inside the study area influence approximately 9 percent of the WSA (the area of influence is an estimate of the acreage in the WSA from which these features can be seen).

The area north of the Owyhee River is influenced by outside sights and sounds which include the agricultural fields and structures associated with The Hole-in-the-Ground Ranch, Birch Creek Ranch, and a smaller ranch downstream from both.

Considering only the internal man-made features, the WSA appears to be generally natural. However, the cumulative influence from internal and external sights and sounds is substantial and decreases the overall naturalness of the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Diverse topography is the major factor contributing to outstanding opportunities for solitude. With the exception of the southern plateau, the WSA offers a variety of terrain providing good topographic screening. However, the size and shape of the WSA constrain opportunities for solitude because the location of private inholdings create narrow travel corridors which restrict the ability of a visitor to avoid other visitors.

Only Deer Park along the south side of the river offers substantial vegetative screening. The brush is four to six feet tall and very dense. Additional trees and thick brush occur in scattered locations along the river, but are not thick or extensive enough to provide screening.

The opportunities for primitive and unconfined recreation are outstanding. Day hikers, backpackers, and campers would be attracted by the rugged, scenic beauty of the Owyhee Breaks and the Owyhee River. The size of the study area is adequate for day hikes. It is not large enough to provide an outstanding opportunity for backpacking. Since the deeply cut terrain north of the Owyhee River would discourage cross-country travel, most hikers would follow the natural travel corridors found in side drainages.

Floatboating is the greatest recreational attraction of this WSA. Approximately 4.5 miles of a 65-mile float trip on the Owyhee River is within the study area.

Float trips do not originate or terminate within the study area, but pass through the WSA.

All hikers along the Owyhee River must pass through the 160-acre parcel of private land at Greeley Bar. Vehicle access to the southern part of the WSA from Rome or Jordan Valley is good, but access to the northern section is time-consuming and follows very rough roads.

Special Features

The WSA consists of rolling hills, twisting gulches, a deep river canyon, sharp ridgelines, and steep bluffs. This complex pattern of rugged topography presents an area of geologic interest. Scenery in the canyon is outstanding.

Nothern bald eagles, federally listed as threatened in Oregon, pass through the study area in their annual spring and fall migrations; some eagles winter along the river. (The birds are further discussed in the Wildlife section.)

The WSA is rich in archaeological artifacts. (These are discussed further in the Cultural Resources section.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the Owyhee Breaks WSA is in the Intermountain Sagebrush Province and has the potential natural vegetation of a sagebrush steppe.

Of the vegetative communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, two which grow in the WSA are: big sagebursh/bluebunch wheatgrass and the alkaline vegetation mosaic with representative communities, including greasewood, shadscale, saltgrass and spiny hopsage types.

Boise, Idaho is the only standard metropolitan statistical area with a population over 100,000 within 5 hours' driving time of the WSA.

Energy and Mineral Development

The energy and mineral resources of the Owyhee Breaks WSA were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment and rock chip sampling by the Oregon Department of Geology and Mineral Industries (DOGAMI) under a BLM contract. This geochemical survey became the primary basis for the metallic minerals classification in the WSA. The DOGAMI report is entitled "Geology and Mineral Resources of 18 BLM Wilderness Study Areas, Harney and Malheur Counties, Oregon". Using the DOGAMI report and a heavy mineral analysis conducted by Barringer Resources, Inc., the study area was reevaluated by BLM geologists.

The Owyhee Breaks WSA has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is considered to be moderately favorable for oil and gas, geothermal resources, bentonite, and zeolite, and parts are moderately favorable for mercury, gold, silver, and uranium/thorium. Mercury and silver are strategic and critical minerals with moderate favorability in the study area; but there are no known deposits of strategic and critical minerals in the WSA.

The mineral potential classifications for the WSA are shown in table 3. Map 5 shows the portions of the WSA rated moderate (medium) for mercury, gold, silver, and uranium/thorium.

Oil and gas and geothermal are the main potential energy resources in the area. Because of youthful volcanism and above normal heat flow, most of southeastern Oregon is generally considered favorable for thermal waters for direct-use heat application. Smaller areas within this area are favorable for high-temperature geothermal resources. None have been identified within the WSA.

Oil and gas potential will largely depend on the presence or absence of suitable marine rocks at depth. There has been no deep drilling in the vicinity that has penetrated the Tertiary volcanic cover.

As of January 1, 1984, there were 7 mining claims, in the east-central part of the WSA, and no geothermal or oil and gas leases. The mining

Table 3. Classification of Energy and Mineral Potential, Owyhee Breaks WSA (OR-3-59)

Commodity	Area	Classification Level	Confidence Level
Metals mecury,	See map 5	3	C
gold, silver	Rest of WSA	2	C
tin	Entire WSA	2	B
Geothermal	Entire WSA	3	B
Uranium/Thorium	See map 5	3	B
	Rest of WSA	1	B
Coal	Entire WSA	1	B
Oil and Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	B
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	3	B
Zeolites	Entire WSA	3	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

claims are associated with semiprecious stone (picture rock and jasper), and they lie in the area rated moderate for mercury and silver. No mineral exploration for mercury and silver is known in the WSA.

Very little geologic study of a detailed nature has been done within this area. This area is basically a broad, north-plunging basin filled with upper Miocene to recent lacustrine (lake) and fluvially (river) deposited sediments with interbedded and mesa-capping lava flows. In this part of the basin, known as Rome Basin, the rocks are somewhat younger, and the 'Rome Beds' of middle Pliocene age are predominent. Only a few northwest and north trending normal faults of minor significance are present.

Vegetation

Vegetation throughout the WSA is characteristic of a sagebrush steppe ecosystem. The most prevalent plant communities consist of sagebrush with understories of either bluebunch wheatgrass or needle-and-thread grass. The vegetation is late seral north of the Owyhee River and mid-seral south of the river. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) Climax vegetation would be a bluebunch wheatgrass/Wyoming big sagebrush community.

Wildlife

Habitats immediately adjoining the Owyhee River provide yearlong range for mule deer and are heavily used during normal winters. Severe winters drive deer out of the area north to the vicinity of Leslie Gulch. Relatively small numbers of antelope occupy suitable habitat year around.

The Owyhee River attracts animals such as raccoons, raptors, ducks, geese, and various amphibians. Game fish include rainbow trout, small mouth bass, channel catfish, and crappies. In addition, chukars and California quail are common.

Northern bald eagles migrate through the study area. Normally there are some birds that winter on either the Owyhee Reservoir or river as long as open water persists. Twenty to thirty eagles utilize the Owyhee River and Reservoir.

Livestock Grazing

Portions of four grazing allotments are within the WSA. Table 4 summarizes existing livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and calf, or equivalent animals, for one month).

No livestock improvements have been proposed for the WSA. Existing livestock projects (among the man-made features mentioned in the Naturalness section) include 3 reservoirs and 2 miles of fence.

Vehicles are presently used to place salt along the

Table 4. Existing Livestock Use, Owyhee Breaks WSA (OR-3-59)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)
Birch Creek (No. 0506)	215	04/1-10/31	60	129
Quartz Mountain (No. 0406)	8,800	Winter	8	704
Lodge (No. 0901)	3,150	04/1-10/31	16	504
Morcum (No. 0907)	150	Yearlong	41	62
Totals	12,315			1,399

periphery of the study area. Horses are used to move cattle to and from the area.

Cultural Resources

An archaeological survey of the Owyhee River from Rome to the reservoir found a large number of sites that indicate the river area was intensively used by Native Americans. Located in the WSA are 21 early campsites and six stone-tool manufacturing stations. There are also four petroglyph sites, one of which is a large field located near the river that is being extensively vandalized.

The bottom land in the canyon was homesteaded in the early 1900s. A stone house of quarried sandstone and a few old foundations remain from those early homesteads.

Recreation Use

The diversity of game species provides good hunting and fishing opportunities in the WSA. However, only a few hunters or fishermen use the WSA because of its inaccessibility.

The dominant recreational activity in the study area is floating the Owyhee River. This activity is usually limited to March through June. However, in years with above average runoff the season may extend into mid-summer. Canoeists, kayakers and floaters using very small rafts may be able to extend the season even longer. Most visitors float the river in inflatable rafts. Kayaks are the second most popular craft and a few driftboats usually float each year. The usual put-in point for this river section is the BLM launch site in Rome. There are several take-out points.

The number of people floating the Owyhee River has increased steadily since 1974 and this trend is expected to continue. A total of 1,261 people floated this stretch of the Owyhee River in 1982.

Economic Conditions

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 1,399 animal unit months (AUMs) of livestock forage, and an unknown amount of recreation activity annually. No economically significant changes in outputs are expected.

The economic value of existing outputs amounts to $10,548 annually, and local personal income generated by existing outputs amounts to $22,496 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

Under the **all wilderness alternative**, 13,100 acres would be added to the National Wilderness Preservation System (NWPS), including steep bluffs, twisting gulches and ridgelines, rolling hills, a high plateau and 4 1/2 miles of the Owyhee River. Outstanding scenery in the Owyhee River Canyon, important raptor nesting habitat and deer range, and riparian and aquatic habitat (scarce in the desert) would be preserved.

The all wilderness alternative would enhance the naturalness of the area by closing the four miles of ways and preventing the construction of new roads or new surface disturbance, except those associated with valid mining claims.

Development of the inholdings and access to them could reduce the naturalness of the area, reduce opportunities for solitude or primitive types of recreation, and adversely affect special wilderness features.

The **enhanced wilderness alternative** would add 13,460 acres to the NWPS, assuming the 360 acres of private inholdings could be acquired. It would include all of the protection afforded by the all wilderness alternative. Also, an attempt would be made to acquire public access easements across adjacent private property if the landowners were agreeable.

Acquisition of the inholdings would eliminate the possibility of their development, enhance opportunities for solitude and primitive recreation and prevent impairment of the area's naturalness.

Under the **no wilderness/no action alternative**, wilderness values could be adversely affected by energy and mineral development (outside the 2,240-acre area withdrawn under the wild river designation), by other resource development activities on public lands, and development of private lands. The RNA, ACEC and wild river designation would provide some protection of wilderness values in portions of the WSA. For example, ORV's would be limited to existing routes throughout the WSA, and no mineral location or leasing would be allowed within 1/4 mile of the Owyhee River. However, mineral development could occur on valid existing claims within this withdrawn area and anywhere outside this area along the rim. Such development could adversely affect special wilderness features and limit opportunities for solitude and primitive recreation. Vehicle use on existing trails would adversely affect opportunities for solitude.

Effects on Energy and Mineral Development

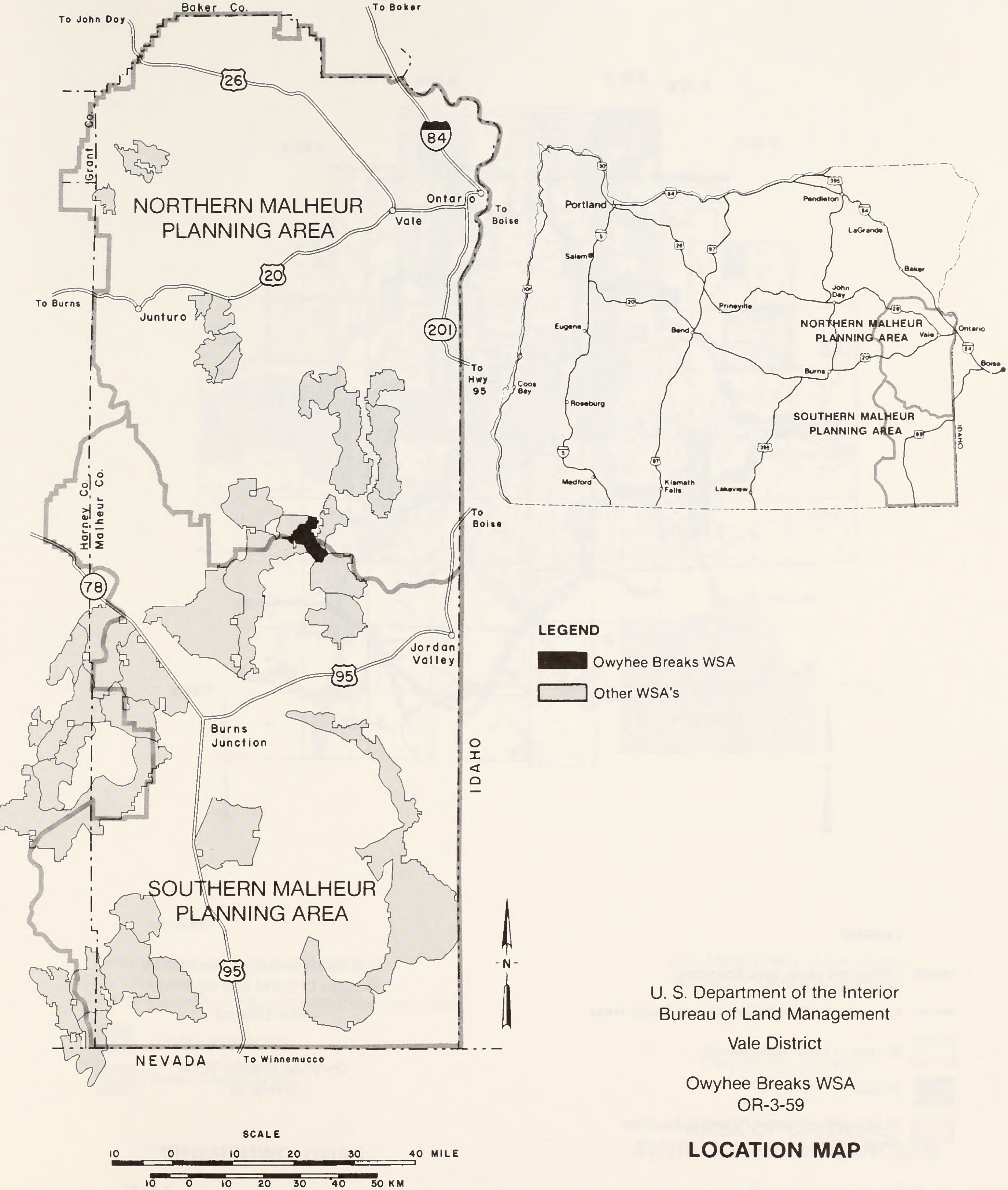
Areas designated wilderness would be withdrawn from mineral exploration and development. Not including the 2,240 acres already withdrawn by the wild river designation, 10,860 acres would be withdrawn by wilderness designation under the **all wilderness alternative**, and 10,860 acres, plus an additional 360 acres if the private inholdings are acquired, as proposed under the **enhanced wilderness alternative**.

These withdrawals would include the areas rated moderate for oil and gas, geothermal, bentonite, and zeolite, which encompass the entire WSA, and would also include the portion rated moderate for silver, mercury and gold totaling 4,960 acres and the portion rated moderate for uranium and thorium totaling 280 acres.

No acreage would be withdrawn by wilderness designation under the **no wilderness/no action alternative**. Existing restrictions regarding no mineral location or leasing within 1/4 mile of the Owyhee River (2,240 acres in the WSA) would continue.

Effects on Economic Value and Local Income

The only economic effects for the all wilderness and enhanced wilderness alternatives result from road closures which would increase operating costs of the livestock operations. Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness and enhanced wilderness alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $14 per year.



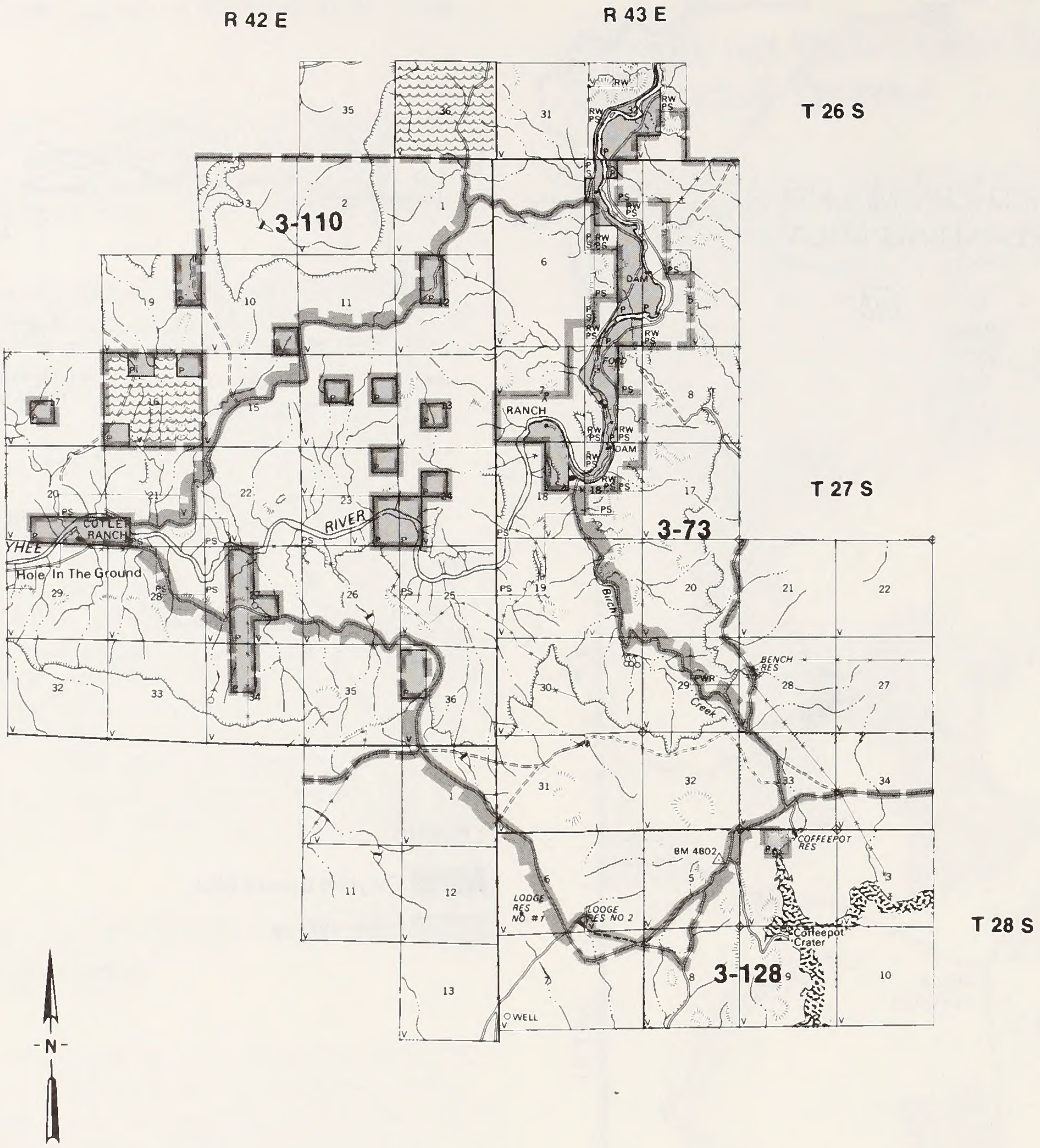
U. S. Department of the Interior
Bureau of Land Management

Vale District

Owyhee Breaks WSA
OR-3-59

LOCATION MAP

MAP 1



LEGEND

━ Wilderness Study Area Boundary

╍ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▩ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

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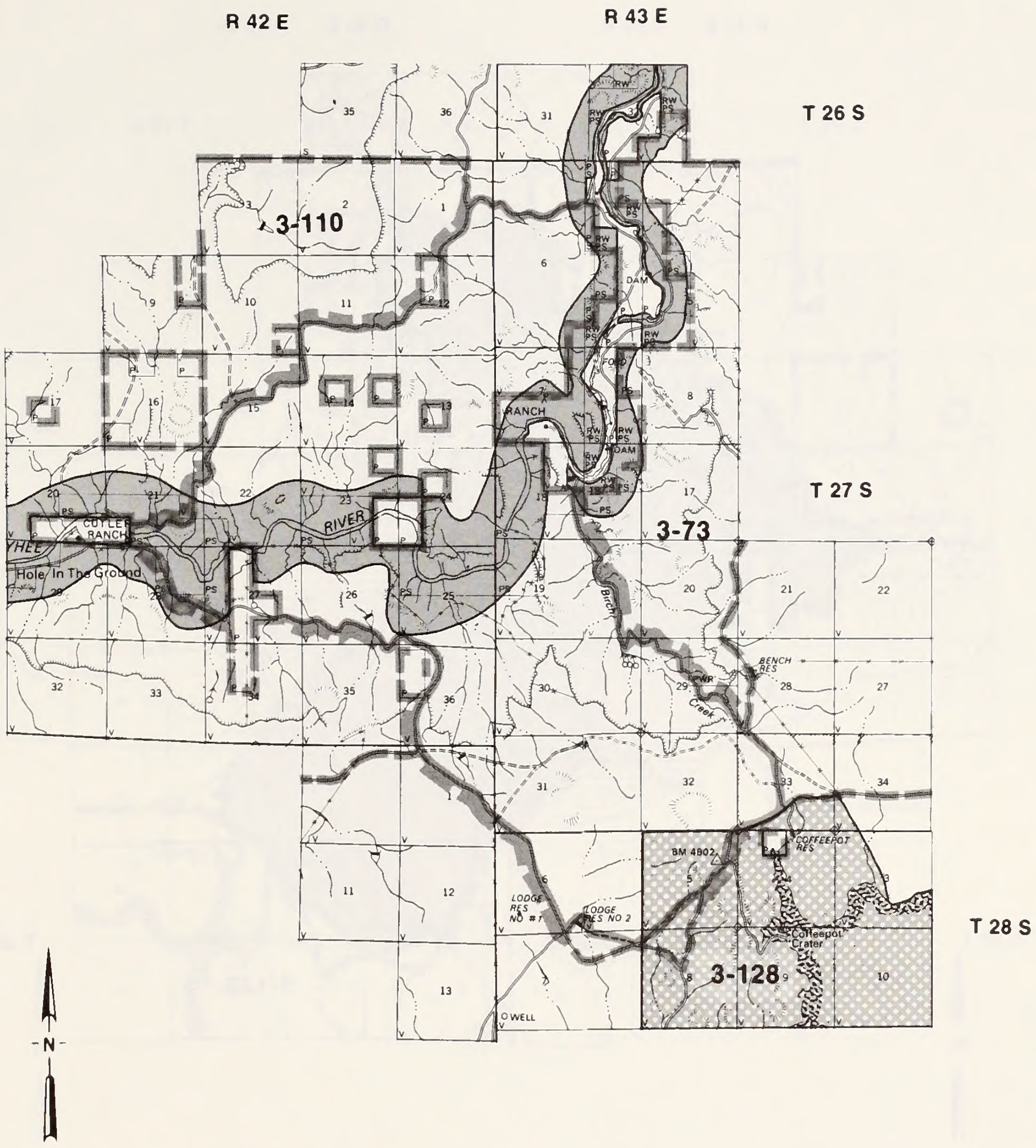
LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

▨ Owyhee River ACEC

░ Jordan Craters ACEC

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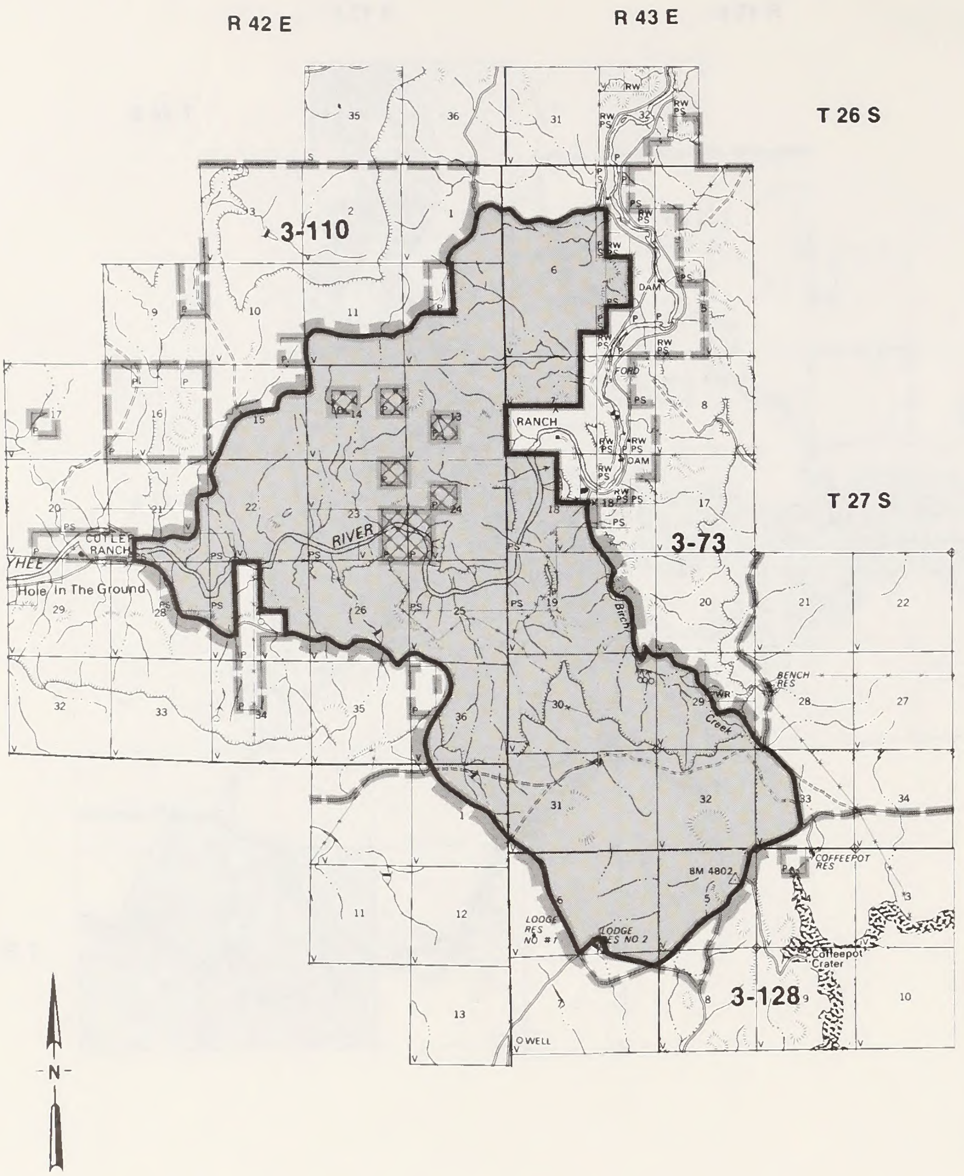
AREA OF CRITICAL ENVIRONMENTAL CONCERN

1 0 1 2 MILES

MAP 3



LEGEND

- Wilderness Study Area Boundary
- Boundary of Adjacent Wilderness Study Areas
- ▢ Recommended Suitable for Wilderness
- ▨ Non-Federal Land within Recommended Wilderness

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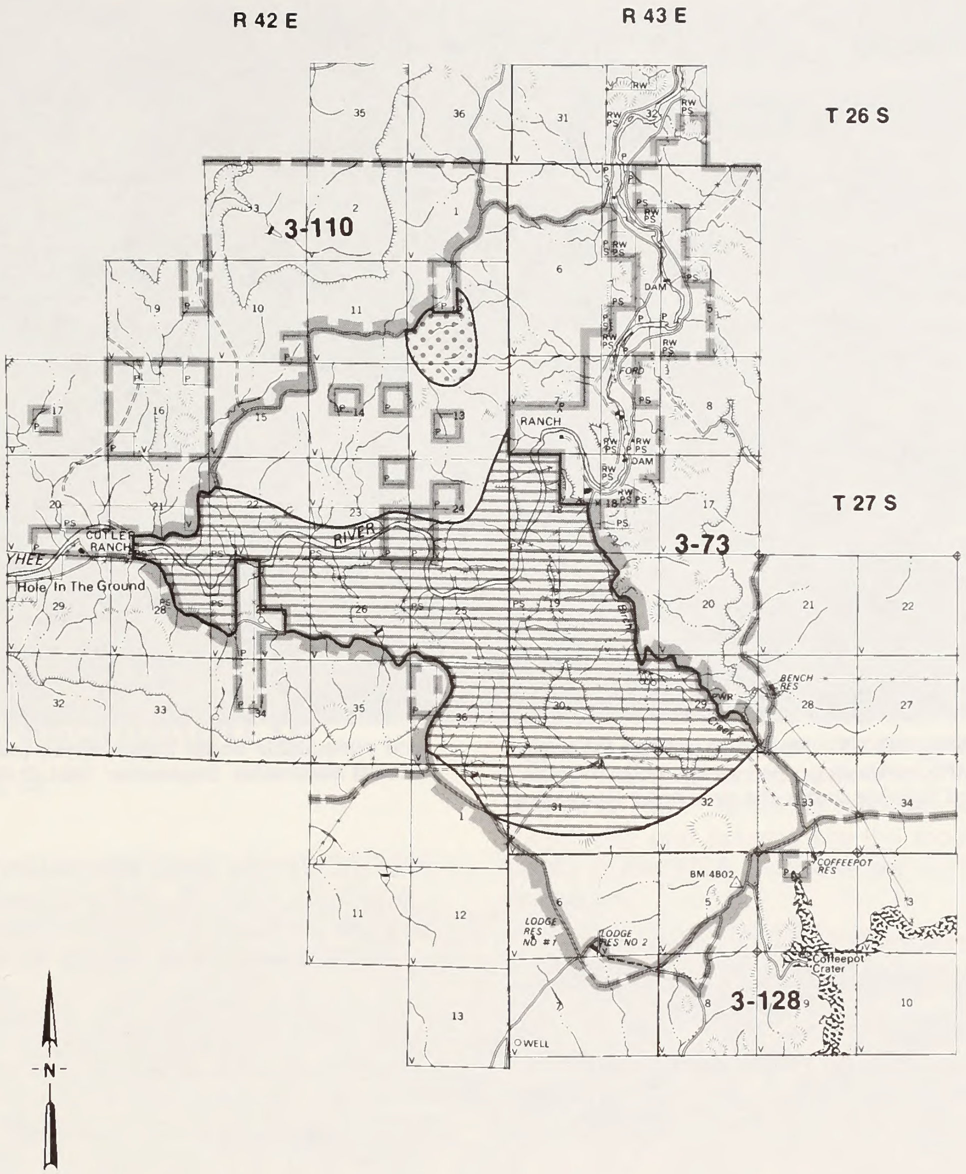
ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 4



▤ **Medium Potential (3C) for Gold, Silver and Mercury**

░ **Medium Potential (3B) for Uranium**

Entire WSA:
Medium Potential
(3B) for Geothermal Resources,
Oil and Gas, Bentonites and Zeolites

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MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 5

Owyhee Breaks WSA, OR-3-59. West side of WSA looking northeast across the northern portion of the WSA. Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Owyhee Breaks WSA, OR-3-59. Northeast side of WSA looking southwest down onto Birch Creek Ranch (the WSA is in the background beyond the ranch at lower center). Within area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. The Owyhee River, visible adjacent to the ranch, flows pass the bluffs in the center of the photo. The Hole-in-the-Ground is visible at upper right. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Blue Canyon Wilderness Study Area (OR-3-73)

General Description of Study Area

The Blue Canyon wilderness study area (WSA) is in Malheur County, approximately 47 miles southwest of Vale, 20 miles northwest of U.S. Highway 95, and 26 miles northwest of Jordan Valley (see map 1).

The WSA contains 12,700 acres of public land (see map 2). Also, there is a 40-acre parcel of private land in the WSA, located near the southeastern boundary.

The study area is oblong, approximately 9 miles long and 5 miles wide at its widest point. It is bordered by roads in the northeast, southeast and southwest, and by Bureau of Reclamation-administered land and private and split-estate land on the west and north. Five parcels of private property abut the study area along the west and east borders. A 2-mile-long dead-end road enters the study area from the southeast, forming part of the boundary. The road dead-ends at five mines along Diamond Butte Ridge, two of which are inside the WSA. The Owyhee River and Reservoir parallel the west and north boundaries within a mile of the WSA.

This razorback ridge bisects the WSA in a north-south orientation, culminating at Diamond Butte in the northern end of the WSA. The main ridge is hilly and cut by numerous drainages along its flanks. The southern portion of the WSA in the bottom of Blue Canyon is relatively level. Sagebrush and grasses are the most common plants in the WSA. Junipers are scattered along the drainages.

Interrelationships

The Blue Canyon WSA is adjacent to the Owyhee Breaks WSA (3-59) on the southwest and is separated by a road.

The river corridor in the WSA is included in the Owyhee River Area of Critical Environmental Concern (ACEC) (see map 3). Special management to protect the values of the ACEC includes the following:

- limiting ORV use to designated roads and trails;
- erecting barriers and signs to deter ORV use and protect the fragile habitat;
- continuing river patrols during high use to monitor and prevent over use which may damage the sensitive values; and

- conducting studies of river carrying capacity and then regulating river use to prevent damage to sensitive plants, fish and wildlife habitat.

These restrictions for the ACEC would continue to apply within the WSA regardless of whether or not the area is designated wilderness.

The portion of the Owyhee River adjacent to the WSA is part of a 50-mile segment of the river that has been designated a wild river component of the National Wild and Scenic Rivers System.

The WSA is bordered on the west and north by land administered by the Bureau of Reclamation in connection with their management of the Owyhee Reservoir.

A portion of the land along the Owyhee River is part of a power site reserve, which earmarks the land for potential water power and water storage development. This "withdrawal" will be reviewed because of the wild river designation, which may lead to its revocation. Power site development is not foreseen, and therefore not discussed further.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- predominant jasper mines on Diamond Butte Ridge and their access road,

- potential development of nine mining claims in the southern portion of the WSA that could be developed prior to wilderness designation (two of these claims are at the end of the dead-end access road),

- existing developments outside of the WSA and their effects on the WSA's naturalness,

- future use of the private property in the WSA (effects of wilderness designation on private lands are discussed in the Statewide EIS volume), and

- effects of adjacent private lands on public access to the WSA.

Also raised as an issue in this WSA was the effects of the WSA's poor configuration on its suitability as wilderness.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (preferred alternative)

An alternative which would combine this WSA with Owyhee Breaks WSA by closing the Birch Creek road which separates them is not analyzed. The road is critical to operation of the Birch Creek Ranch.

A partial alternative and enhanced wilderness alternative are not analyzed because the distribution of outside sights and sounds such as the mines on Diamond Butte Ridge and their access road, Birch Creek Ranch, the southern boundary road, and the cumulative effect of outside man-made features make it impossible to eliminate or reduce manageability problems through boundary adjustments.

All Wilderness

The all wilderness alternative would recommend all 12,700 acres of public land in the WSA as suitable for wilderness (see map 2). For purposes of analysis, it is assumed the 40-acre private inholding would not be acquired.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features, in addition to ACEC constraints, relevant to this analysis:

- continued availability for mineral exploration and development with no-surface-occupancy restrictions on mineral leases within sight of the Owyhee River,

- restriction of off-road vehicle (ORV) use to existing routes outside the ACEC, and

- construction of proposed livestock projects, including 4 spring developments.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area would be manageable as wilderness, but if additional development occurred on private land and mining claims in and adjacent to the WSA, it would be difficult to preserve wilderness values. Existing developments and activities on the private lands and mining claims detract from the wilderness values in much of the WSA, and additional developments and intensified activity would compound the problems of managing the area as wilderness. The 40-acre private inholding contains a spring, and that increases the possibility that the land might be developed.

Additional development could occur at two ranches next to the Owyhee River and adjacent to the study area, at three mines within the study area, and at three mines along a dead-end road which extends into the study area along Diamond Butte Ridge, the highest part of the study area. Developments on the ridge might be more visible than developments in other parts of the WSA.

Table 1. Summary of Proposed Management Under Each Alternative, Blue Canyon WSA (OR-3-73)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	12,700	0
Acres Closed to ORVs by Wilderness Designation [1]	12,700	0
Miles of Ways Closed	6	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	12,700	0
Structural Livestock Projects Developed: Springs (number)	0-4	4

There are no developments now on a 40-acre private inholding at the head of Blue Canyon, but the land could be developed in the future. If the owners of nine mining claims discovered a valuable mineral deposit before the area was designated wilderness, they could mine on the claims regardless of the effect on wilderness values. As of the summer of 1984, claimants had disturbed the surface of only three of the claims.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of maintaining options for development of potential energy and mineral resources outweighs the benefits of preserving wilderness values, particularly in view of the difficulties which could be encountered in managing the area to preserve its wilderness values. The area has a moderate potential for the occurrence of geothermal resources and oil and gas, and part of the area has a moderate potential for the occurrence of gold and silver.

The area's wilderness values are adversely affected by views from within the area of developments and activities on adjacent lands, including buildings and hay fields on two ranches, a dead-end mining access road along Diamond Butte Ridge (the highest part of the study area), and three mines on Diamond Butte Ridge. Even if the dead-end road were closed, it could not be restored to a natural appearance. Thus, it would permanently affect the area's wilderness values.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Blue Canyon WSA is generally natural but developments within and outside the area diminish the WSA's naturalness. About 6 percent of the WSA is influenced by man-made features, including 6 miles of ways (vehicle routes established and maintained solely by the passage of vehicles), 2 miles of fence, a rock corral (abandoned wild horse trap), and three active mines and an associated

Table 2. Summary of Environmental Consequences of Alternatives, Blue Canyon WSA (OR-3-73)

Resource or Activity	All Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 12,700 acres to NWPS and maintain existing wilderness characteristics. Closure of 6 miles of ways would enhance wilderness values. Development of mining claims could adversely affect wilderness values. Area would be manageable as wilderness.	Mineral exploration and development could adversely affect wilderness values anywhere in WSA. Use of vehicles would prevent revegetation of ways.
Energy and Mineral Development	Development precluded on 12,700 acres, including 12,700 acres with moderate potential for geothermal, oil and gas, bentonite, and zeolite and high potential for semiprecious stone and 4,732 acres with moderate potential for gold and silver.	No impact.
Livestock Grazing	Potential increase of 80 AUMs and better livestock distribution foregone if spring developments are not allowed.	Increase of 80 AUMs and improved livestock distribution would be realized.
Economic Value and Local Income	Decrease in economic value by $9 and increase in local personal income by $1,286 if proposed structural projects were allowed. There would be no change from the present situation if no structural projects were allowed.	Decrease in economic value by $9 and increase in local personal income by $1,286 from construction of all proposed projects.

cabin. Most of these features are in the southern half of the WSA.

The three mines lie along a jagged, steep switchback road which climbs down the open western slope of the ridge from its highest point. Excavation tailings have been pushed down the slope, thereby emphasizing the mine locations because of the marked color contrasts.

Cumulative effects of outside sights and sounds significantly diminish the naturalness of the WSA, particularly the Diamond Butte Ridge area which is the highest part of the study area and which provides a major travel corridor throughout the WSA. The outside sights and sounds consist of roads and ways (including access roads to Black Rocks, Birch Creek Ranch, and the active mines on Diamond Butte Ridge), reservoirs, a fence, the Birch Creek and Glover ranches, three mines on the Diamond Butte Ridge that are outside the WSA, and an area of brush control.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude or primitive and unconfined recreation are outstanding in the WSA. This is due to the steep and rugged topography of Blue Canyon and the scenic qualities of Diamond Butte. Topographic screening is good in the side canyons on the west side of Diamond Butte, but once the visitor leaves these canyons, screening is minimal.

In addition, the dispersal and cumulative effects of interior and exterior sights and sounds from ranching, mining, and recreation activities on and around Owyhee Reservoir and the narrow configuration of all but the mid-section of the WSA further reduce the opportunities for solitude.

Hiking is otherwise enhanced because of the additional water-associated recreation activities on the Owyhee River and Reservoir, and easy access provided by the Birch Creek, Black Rocks, and the active mining access roads. The picturesque rock spires, outcrops and cliffs of Diamond Butte Ridge and Blue Canyon are strong attractions for hikers.

Special Features

The WSA contains unique geological features consisting of severe erosion patterns and rock outcrops, spires, and cliffs in the canyons and breaks and along Diamond Butte Ridge, interspersed with gentle slopes of the plateaus.

Most of the WSA is a flyway for northern bald eagles in their annual spring and fall migrations. These birds are federally listed as threatened in Oregon. (The birds are discussed further in the Wildlife Section.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey/Küchler method of classifying ecosystems, the WSA is located in the Intermountain Sagebrush Province and has the potential natural vegetation of a sagebrush steppe. Big sagebrush/bluebunch wheatgrass is the major plant community.

Of the plant communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, two are found in the WSA: the low sagebrush/bluebunch wheatgrass community and alkaline vegetation mosaic with other representative communities, including greasewood, shadscale, saltgrass, and spiny hopsage types.

Boise, Idaho is the only standard metropolitan statistical area with a population over 100,000 within 5 hours' driving time of the WSA.

Energy and Mineral Development

Energy and mineral resources of Blue Canyon WSA were evaluated from available geologic data by TERRADATA, a consulting firm under contract with BLM. Technical details of the findings of the evaluation are incorporated in a TERRADATA report titled 'Assessment of Geology, Energy, Mineral Resources of Cedar Mountain Geologic Resource Area.' Using additional information such as general mineral resource information, mining claims and leases, BLM geologists reevaluated this report.

The WSA is within the Cedar Mountain geologic resource area which has been classified according to a rating system which indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the amount and quality of data on which the classification is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The study area contains geologic environments that are moderately favorable for the occurrence of geothermal resources, oil and gas, zeolites, bentonite and gold and silver. Silver is a strategic and critical mineral; however, no strategic and critical mineral deposits are known to exist in this WSA. Semiprecious stone is rated high throughout the WSA.

Mineral potential classifications for the WSA are shown in table 3. Map 4 shows the portions of the WSA rated moderate (medium) for gold and silver.

Because of youthful volcanism, most of southeastern Oregon is generally considered favorable for thermal water for direct-use, heat application. Smaller areas within this area are favorable for high-temperature geothermal resources. None have been identified within the WSA. Oil and gas potential will largely depend on the presence or absence of suitable marine rocks at the subsurface. There has been no drilling in the vicinity which has penetrated the Tertiary volcanic cover.

As of January 1, 1984, there were 11 mining claims (along the western edge) in the WSA, and no oil and gas or geothermal leases. The mining claims are associated with semiprecious stone (jasper, agate and picture rock). Picture rock and jasper can indicate gold deposits.

The rocks exposed in Blue Canyon WSA are Tertiary and Quaternary in age. Tertiary rocks consist of tuffs, pumicites, tuffaceous sedimentary rocks, silicic flows, lacustrine (lake) and fluvial (stream) deposits (poorly consolidated, bedded silicic ash and pumice, diatomite, minor mudflow deposits). Quaternary rocks consist of landslide and debris flow deposits (thin flows of open textured olivine basalt and minor flow breccia). Tertiary rocks are underlain by a thick accumulation of tertiary

Table 3. Classification of Energy and Mineral Potential, Blue Canyon WSA (OR-3-73)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, silver)	See map 4	3	B
	Rest of WSA	2	B
Geothermal	Entire WSA	3	C
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	2	B
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	3	B
Diatomite	Entire WSA	2	B
Zeolites	Entire WSA	3	B
Semiprecious Stone	Entire WSA	4	D

Legend:
Class 1 - Lack of indications of favorabiltiy
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

volcanic and some sedimentary rocks. It is not known what underlies these rocks at depth.

Vegetation

Vegetation throughout the WSA is characteristic of a sagebrush steppe ecosystem. The successional stage is predominantly mid-seral; however, there are some areas in late seral and climax stages because the terrain is too rugged and inaccessible for livestock. (Seral refers to the stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The climax vegetation is a bluebunch wheatgrass/big sagebrush community. Several tributaries of Blue Canyon support excellent dense stands of riparian vegetation.

Wildlife

Mule deer and antelope use the area during mild winters; otherwise, they migrate to the north and winter in the Black Rocks area. Antelope usually winter on the northeastern reaches of the study area. The canyon rims and spires are used by raptors, particularly the northern bald eagle, along their migration flyway. Some of these birds winter on the Owyhee River when open water persists. Twenty to thirty eagles utilize the Owyhee Reservoir and River.

Livestock Grazing

Portions of 2 grazing allotments are within the WSA. Table 4 summarizes existing and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Four spring development projects are proposed for the study area. These projects would better distribute livestock and have the potential of increasing livestock forage in the allotment by 80 AUMs.

Table 4. Existing and Potential Livestock Use, Blue Canyon WSA (OR-3-73)

Grazing Allotment	Licensed AUMS in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
McCain Springs (No. 0505)	10,760	Dec.-Mar Apr.-Oct.	16	1,593	80
Birch Creek (No. 0506)	215	Yearlong	40	86	0
Totals	10,975			1,679	80

[1] Increase might not result in increased use in the allotment (see narrative).

Existing range projects (among the man-made features mentioned in the Naturalness section) are 2 miles of fence.

Vehicles are presently used to place salt and to check livestock near the periphery of the WSA. Horses are used to check livestock inside the WSA and to move livestock to and from the area.

Recreation Use

Opportunities for day hiking, backpacking, and deer and antelope hunting are good, although current recreation use is low. The dead-end mining access road in the southern portion of the study area provides the only access along the ridge for vehicle-oriented recreation. ORV use is extremely limited due to the broken and rocky terrain. Some use it occurs along ways, including the base slopes of the Diamond Butte Ridge. The WSA has been designated as an area where vehicles are limited to existing roads and ways.

The excellent fishing and boating on nearby Owyhee Reservoir bring people into the area who take advantage of its primitive recreation opportunities.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 1,679 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $12,660 annually and local personal income generated by existing outputs amounts to $26,998 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 12,700 acres of sagebrush steppe to the National Wilderness Preservation System (NWPS). It would preserve the natural character of the scenic geology in Blue Canyon and Diamond Butte Ridge, the low sagebrush/bluebunch wheatgrass and the alkaline mosaic communities listed in the Oregon Natural Heritage Plan, and the outstanding opportunities for solitude and primitive recreation.

Elimination of vehicle traffic on 6 miles of ways would increase naturalness and improve opportunities for solitude and primitive recreation.

The existing mining road would remain open to service the mine operations. This would continue to affect the naturalness of a small portion of the study area. In addition, if claimants on 11 existing mining claims in the WSA discovered a valuable mineral deposit before the area was designated wilderness, development of these claims could affect naturalness across a larger area. Development of private land in the WSA could also affect the area's naturalness. Development outside but within view of the WSA likewise could increase the area in which naturalness is adversely affected.

Under the **no wilderness/no action alternative**, any mineral development could adversely affect wilderness values, including the area's special wilderness features and opportunities for solitude and primitive recreation. Some adverse effects from oil and gas or geothermal lease development could be mitigated through lease stipulations, such as the no-surface-occupancy restrictions near Owyhee Reservoir.

The no wilderness/no action alternative would allow unconstrained use of motorized vehicles and equipment for the maintenance of livestock projects and the management of livestock. This could affect naturalness in a larger area than under the all wilderness alternative.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Under the **all wilderness alternative**, 12,700 acres would be withdrawn from mineral exploration and development, including the 12,700 acres rated moderate for geothermal resources, oil and gas, bentonite, and zeolite, and the 4,732 acres rated moderate for gold and silver.

No acreage would be withdrawn under the **no wilderness/no action alternative**. The no-surface-occupancy restriction on mineral leases would continue to apply in the area within view from the Owyhee River.

Effects on Livestock Grazing

Under both alternatives, livestock grazing would remain at approximately existing levels.

Under the **all wilderness alternative**, the four proposed spring developments might or might not be allowed, depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If the projects were not allowed, an opportunity to improve livestock distribution and increase forage within the allotment by 80 additional AUMs would be foregone. These projects have a benefit/cost ratio less than 1:1.

Under the **no wilderness/no action alternative**, the springs would be developed and an increase of 80 AUMs would be realized along with improved livestock distribution.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the 4 spring developments proposed for this WSA, would be constructed if the area were designated wilderness.

The column for the all wilderness alternative shows the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access, were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness alternative would restrict such vehicle use unless there were no practical alternative. There would be no impact and no increase in cost to the grazing operator from road closures in the WSA.

Table 5. Effects of Alternatives on Annual Economic Value, Blue Canyon WSA (OR-3-73) (1981 price levels)

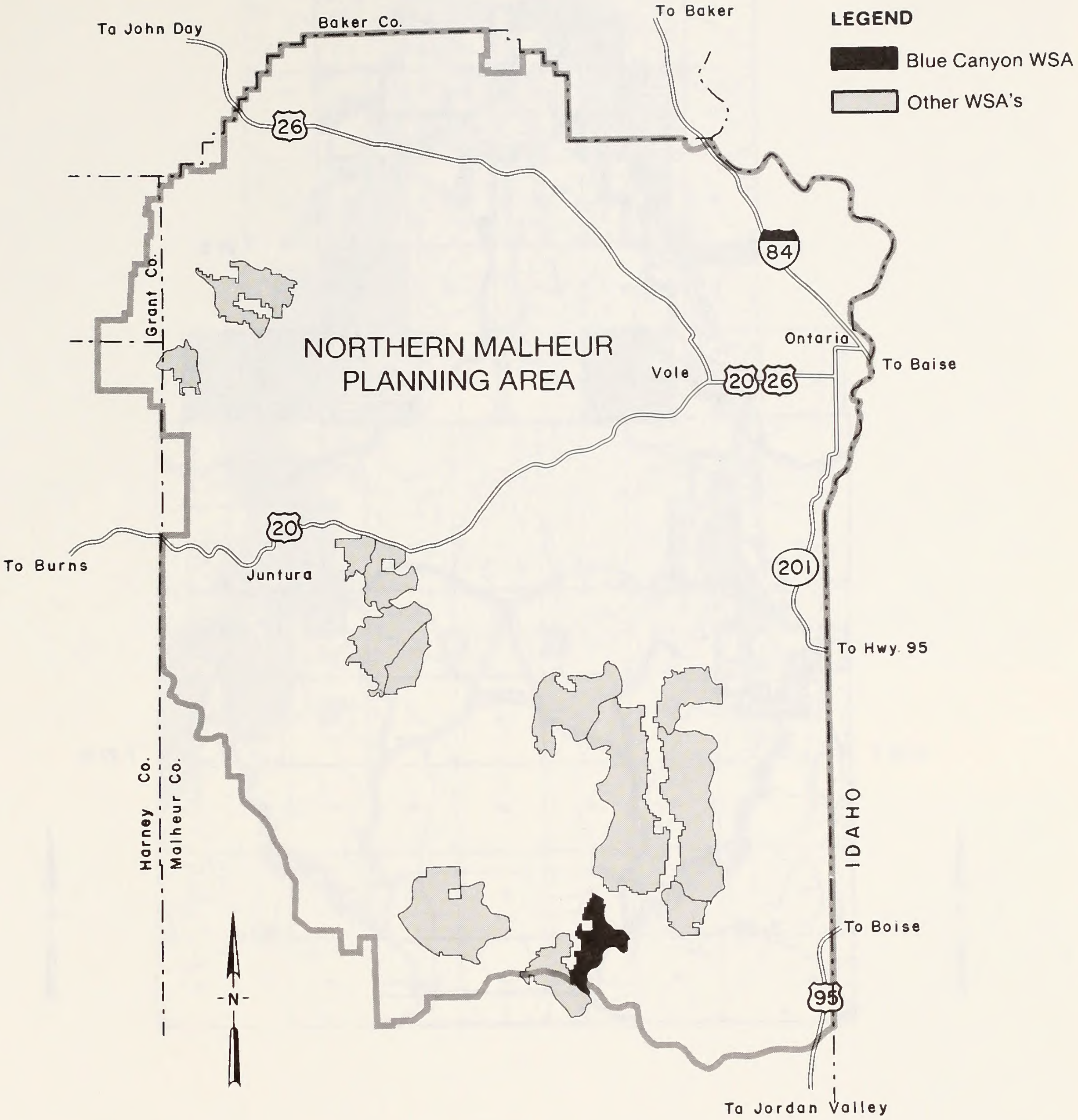
Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investments [1]	AUM	0 to +80	+80
VALUE OF PLANNED INVESTMENTS [2]			
Grazing	$	0 to +603	+603
Investments [3]	$	0 to -612	-612
Net Economic Value [4]	$	-9 to 0	-9

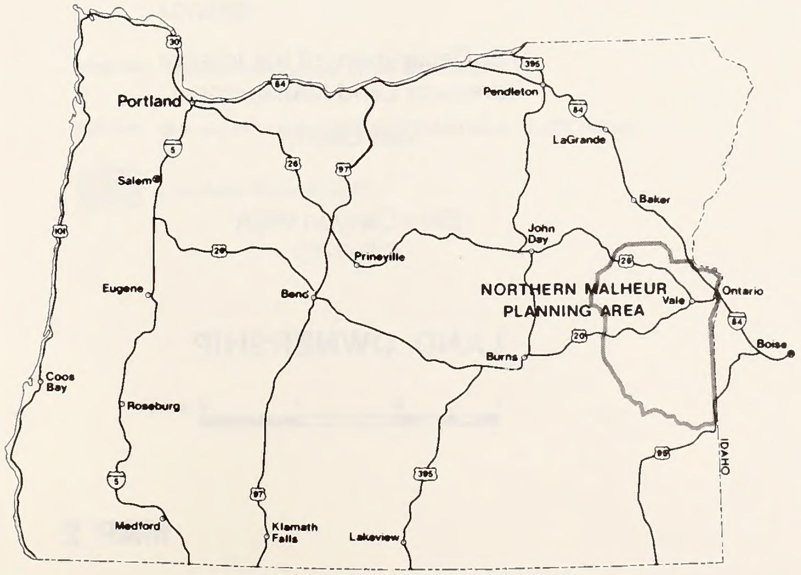
[1] Expected future increases due to range improvement investments.
[2] Structural projects involving up to $7,600 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[4] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

Table 6. Effects of Alternatives on Local Personal Income, Blue Canyon WSA (OR-3-73) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investments [1]	AUM	0 to +80	+80
INCOME FROM PROPOSED INVESTMENTS [2]			
Grazing	$	0 to +1,286	+1,286
Construction activity [3]	$	0 to +1,046	+1,046
Total [4]	$	0 to +1,286	+1,286

[1] Expected future increases due to range improvement investments.
[2] Structural projects involving up to $7,600 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.
[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.





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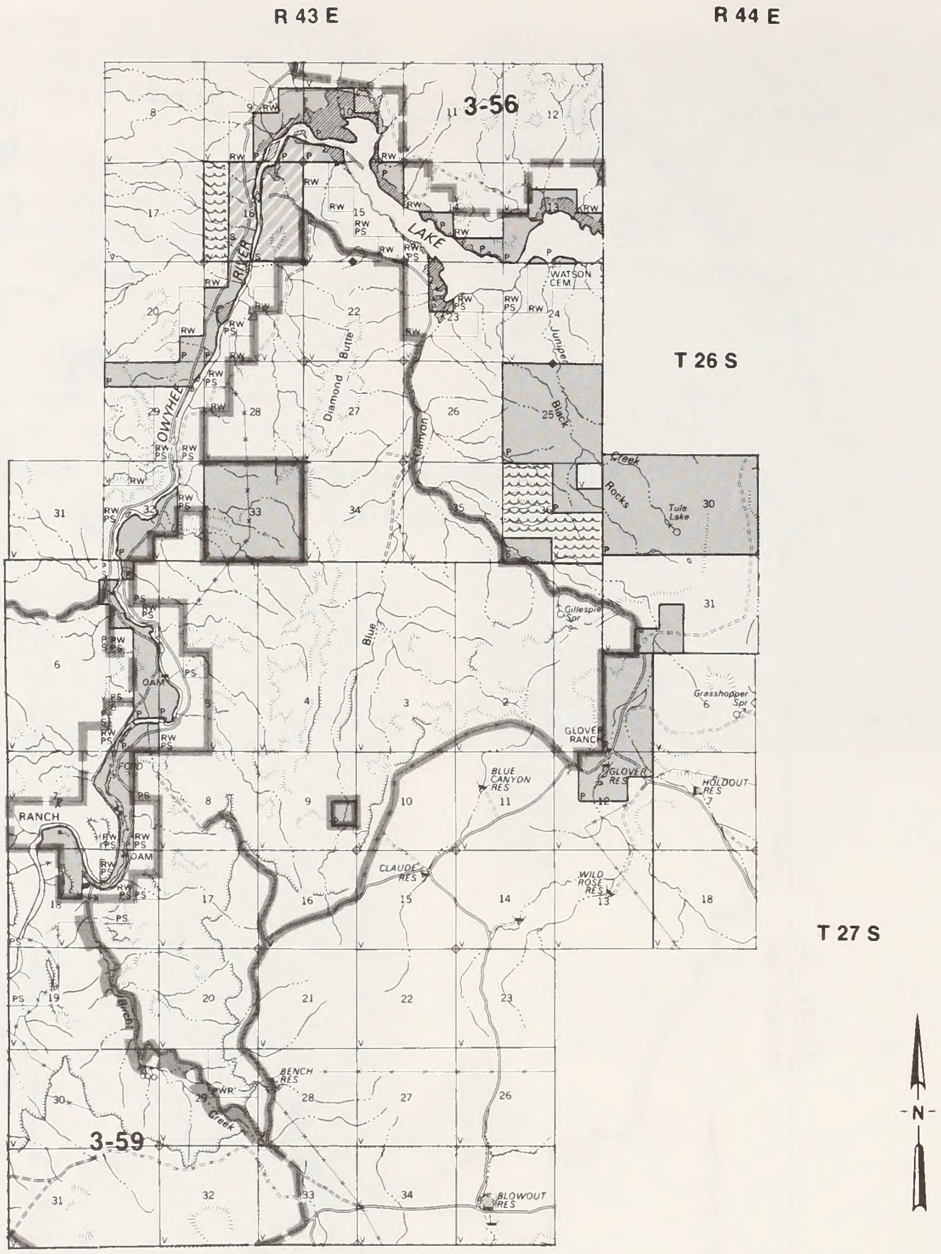
Vale District

Blue Canyon WSA
OR-3-73

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▨ State
- ■ Private
- ≋ BLM Surface-State or Private Subsurface (Split Estate)

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Blue Canyon WSA
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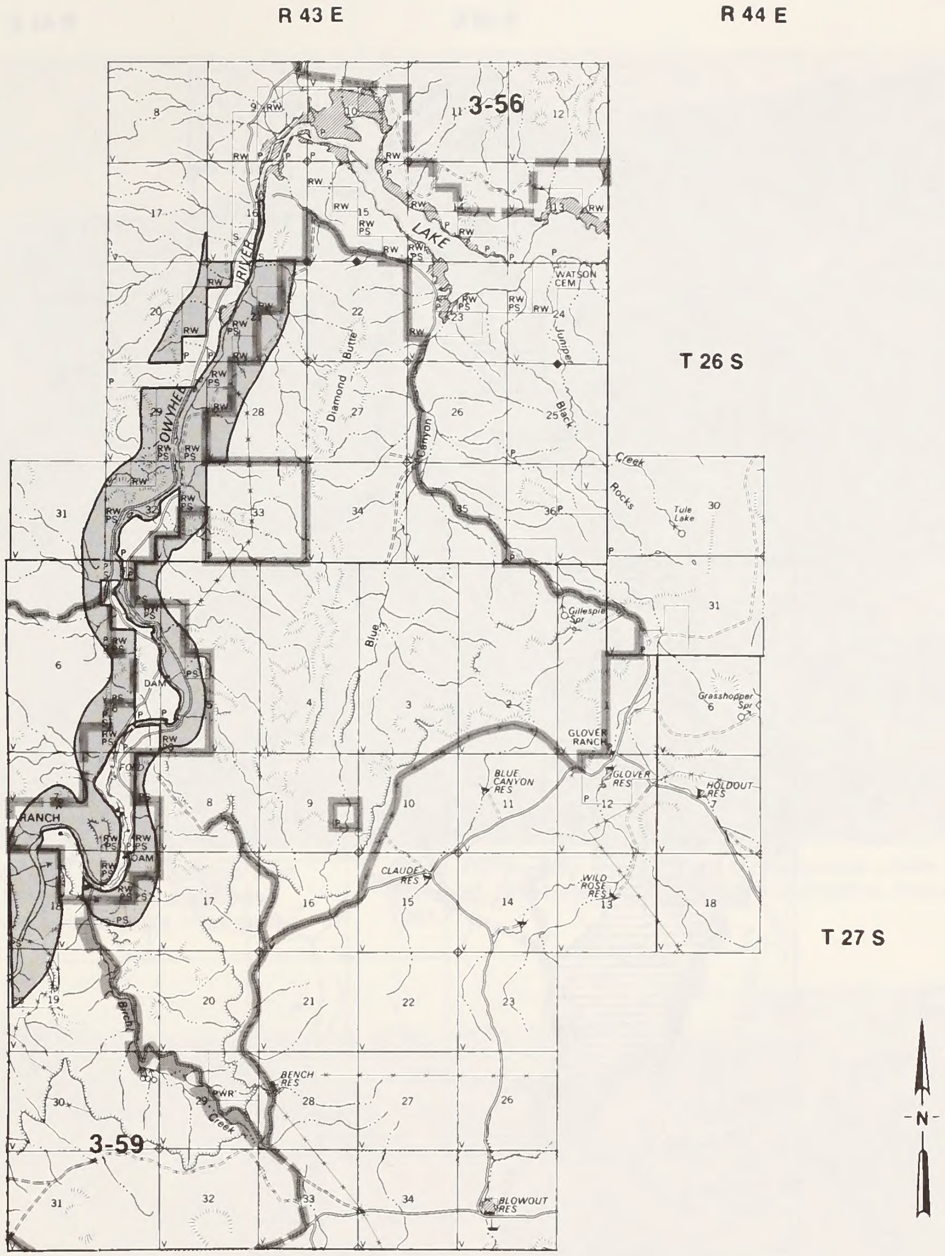
LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

▨ Owyhee River ACEC

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Blue Canyon WSA
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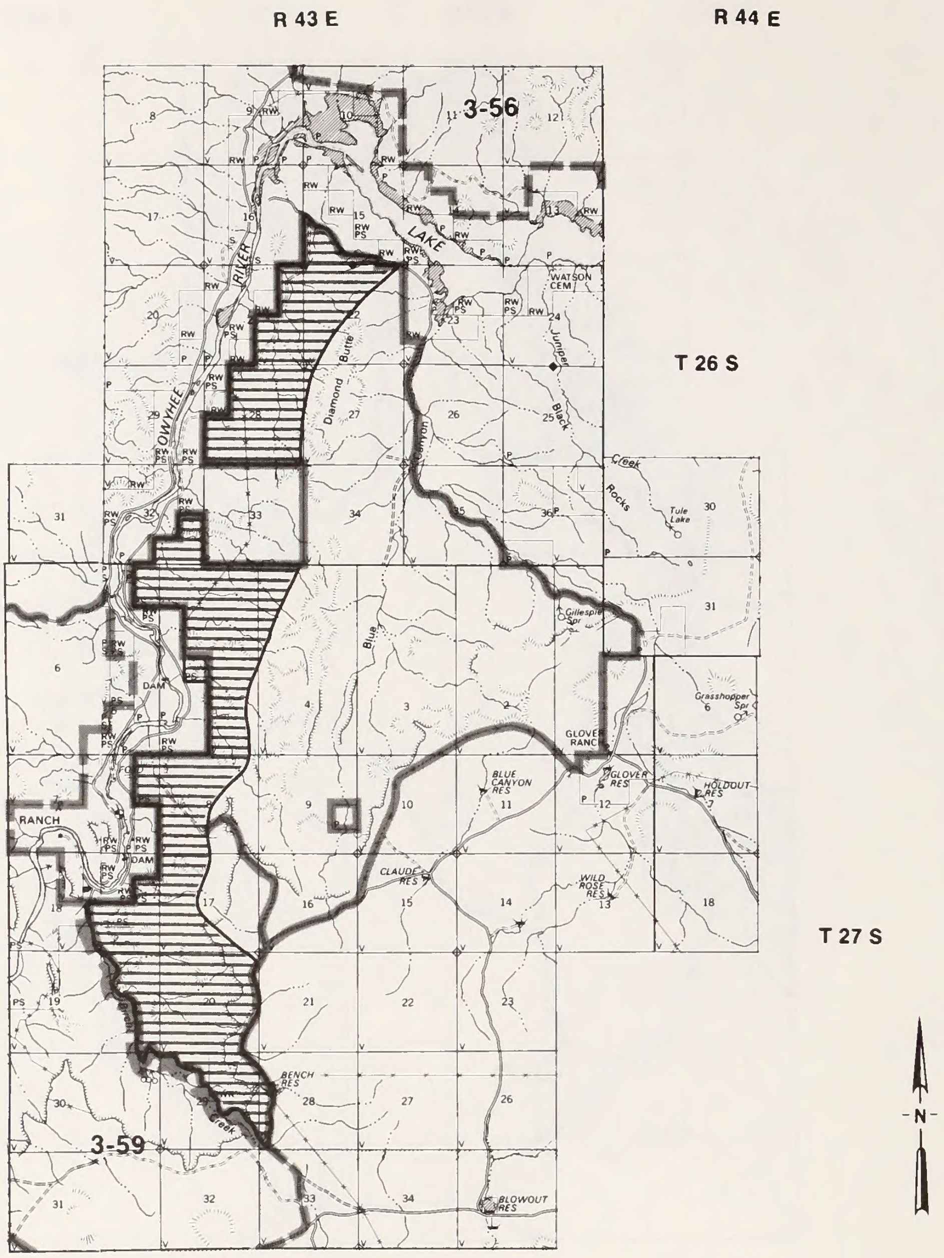
AREA OF CRITICAL ENVIRONMENTAL CONCERN

1 0 1 2 MILES

MAP 3



▤ **Medium Potential (3B) for Gold and Silver**

Entire WSA:
Medium Potential
(3C) for Geothermal Resources
(3B) for Oil and Gas, Bentonite and Zeolites
High Potential
(4D) for Semiprecious Stones

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Blue Canyon WSA
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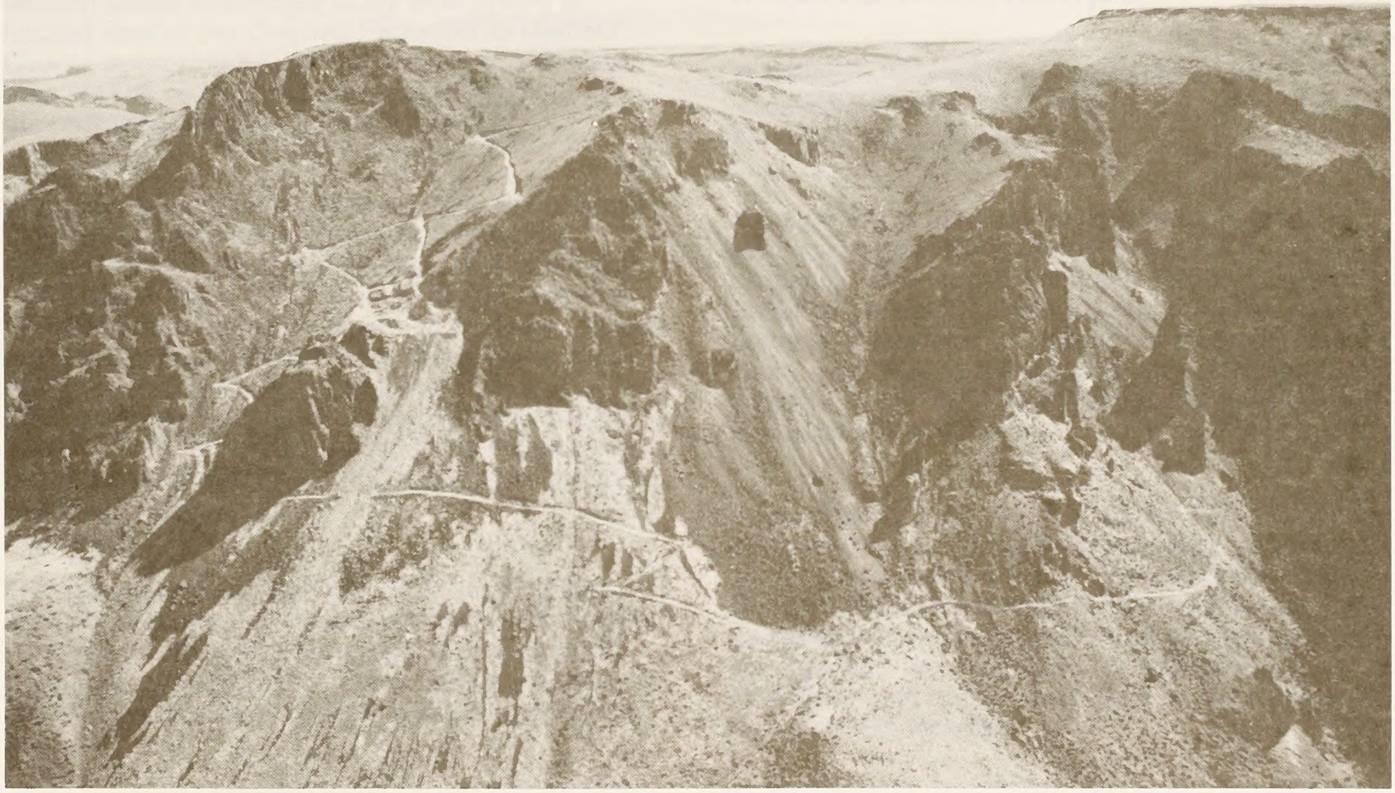
MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Blue Canyon WSA, OR-3-73. West side of WSA looking east into the WSA from the Owyhee River (some of the slopes and bluffs include Bureau of Reclamation lands outside the WSA). Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.



Blue Canyon WSA, OR-3-73. Southern portion of WSA looking east at mining activity along the west face of the WSA's central ridge. Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Slocum Creek Wilderness Study Area (OR-3-75)

General Description of Study Area

Slocum Creek wilderness study area (WSA) is located east of the Owyhee Reservoir in Malheur County, approximately 47 miles south of Vale (see map 1). The nearest highway is U.S. Highway 95 approximately 30 miles to the southeast.

The study area is pear shaped and is approximately 5 1/2 miles long and 3 miles wide containing approximately 7,600 acres. All surface and mineral estate within the WSA is publicly owned (see map 2). Most of the boundary is formed by roads, except in the northwest and southeast corners where both private and public land adjoins the boundary. Private and public land also adjoins the boundary roads. A little more than a mile of the public land along the northwest boundary is managed by the Bureau of Reclamation.

The surface area of the WSA is overlain by thick volcanic deposits that have been cut by intermittent streams, resulting in a land pattern of alternating drainages and steep north-south oriented ridges. Over 85 percent of the slopes exceed a 25 percent gradient.

Natural vegetation consists mostly of sagebrush and bunchgrass. Western junipers are scattered throughout the area. A small relict stand of ponderosa pine is located along the crest of Blue Point Ridge near Dago Gulch.

Interrelationships

The Slocum Creek WSA is adjacent to the Honeycombs WSA (OR-3-77A) on the north. The two WSAs are separated by a road.

Adjacent to the WSA on the northwest is land managed by the Bureau of Reclamation in conjunction with its administration of the Owyhee Reservoir. In other locations along the reservoir, portions of this land are leased for recreational cabin sites. Due to the steep terrain of the land adjacent to this WSA, the likelihood of development is remote but possible.

Approximately 2,130 acres in Upper Leslie Gulch in the northern part of the WSA has been designated as the Leslie Gulch Area of Critical Environmental Concern (ACEC) (see map 3). The ACEC was designated to protect plants which are endemic to the area and are candidates for federal listing as threatened and endangered. Special management for the ACEC includes:

- continuation of grazing, managed to enhance or maintain existing vegetation,

- no new range improvements allowed, unless needed to protect ACEC values, and

- vehicles restricted to existing roads and ways.

These restrictions would continue to apply in the portion of the WSA within the ACEC whether or not the area is designated wilderness.

Most of the WSA is in the Three Fingers wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. Two issues that were raised relating specifically to the Slocum Creek WSA were: potential problems for nearby private landowners (effects of wilderness designation on private lands are addressed in the Statewide EIS volume) and wilderness users due to the lack of sufficient legal public access to the WSA; and the possibility of combining this WSA with adjacent and nearby WSAs into a single wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (preferred alternative)

An enhanced alternative is not analyzed because there is no opportunity to substantially enhance wilderness values. A partial alternative is not analyzed because there is no opportunity to avoid conflicts from other resource uses by recommending only a portion of the WSA suitable as wilderness.

All Wilderness

The all wilderness alternative would recommend all 7,600 acres of the WSA suitable for wilderness (see map 2).

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- development of 2 springs for livestock,

- continued availability for mineral exploration and development, with no surface occupancy on mineral leases within sight of the Owyhee Reservoir, and

- continued restriction of vehicles to existing routes.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The study area is manageable as wilderness. Private land at the southeast boundary would prevent public access at the upper end of the Slocum Creek drainage, the principal recreational travel route in the WSA, but access would be available at the lower end of the drainage.

Table 1. Summary of Proposed Management Under Each Alternative, Slocum Creek WSA (OR-3-75)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	7,600	0
Acres Closed to ORVs by Wilderness Designation	7,600	0
Miles of Ways Closed	2	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	7,600	0
Structural Wildlife Projects Developed: Springs (number)	0-2	2

Table 2. Summary of Environmental Consequences of Alternatives, Slocum Creek WSA (OR-3-75)

Resource or Activity	All Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 7,600 acres to NWPS, including spectacular geological formations, disjunct stand of ponderosa pine, 5 plant species of special interest, outstanding scenery, and bighorn sheep and bald eagle habitat. Maintain wilderness characteristics. Naturalness enhanced by closure of way. The area would be manageable as wilderness.	Mineral exploration and development could adversely affect wilderness values. Use of vehicles in the area would prevent ways from returning to a natural condition.
Energy and Mineral Development	Development precluded on 7,600 acres, including 7,600 acres with moderate potential for gold and tin, oil and gas, bentonite, zeolites, perlite and pumice.	No impact.
Livestock Grazing	If proposed 2 spring developments not allowed, an opportunity to make available an additional 40 AUMs of licensed use would be foregone. Use of motorized vehicles for livestock management would be limited.	Additional 40 AUMs in licensed use realized from 2 spring developments.
Economic Value and Local Income	Decrease in economic value by $4 and increase in local personal income by $643 if proposed structural projects were allowed. There would be no change from the present situation if the proposed projects were not allowed.	Decrease in economic value by $4 and increase in local personal income by $643 from construction of all proposed projects.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of maintaining the option for mineral development in the majority of the area would outweigh the benefits of preserving all wilderness values throughout the area. There is moderate potential for the occurrence of oil and gas, gold, tin, and other minerals in the area. One of the principal wilderness values in the area is a concentration of unusual plants.

Most of the existing access points and travel corridors would require users to cross private property.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA appears generally natural. The rugged terrain has limited the number of man-made features in the WSA.

Four man-made features influence approximately 5 percent of the study area. (The area of influence is an estimate of the acreage in the WSA from which these features can be seen.) The features include a 2-mile way (a vehicle route established and maintained solely by the passage of vehicles) and a 2-mile fence. Both run roughly parallel in the extreme southern end of the study area. The other two developments are an 8-foot long fence and a guzzler.

Major outside sights and sounds affecting naturalness in the WSA are the two roads forming the boundary of the study area. The northern boundary road is well maintained and heavily travelled (approximately 3,000 vehicles annually), while the other boundary road is improved but lightly travelled.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The WSA offers outstanding opportunities for solitude and primitive and unconfined types of recreation. The major factor contributing to opportunities for solitude is the topographic screening provided by the steep and diverse terrain. All of the drainages offer excellent topographic screening because they are winding and steep-sided.

Several broad, rounded ridges extend into the area from the south end. The ridges screen visitors on the ridgetops from other visitors below. However, people on the ridge tops are visible to others on the same ridge and on most other ridges.

Major outside sights and sounds affecting solitude include vehicle use along the northern boundary road and use of the semi-developed camping area in Leslie Gulch.

Opportunities for backpacking in the WSA are limited because of the small area. However, hikers would be attracted to the area because of the scenery, geologic formations, bighorn sheep and easy vehicle access provided by a well-maintained road through Leslie Gulch along the north edge of the area. Hiking access into the WSA along the north boundary is limited because of the steep canyon walls. The only entry point along the north edge is at Slocum Creek.

Hunting opportunities are excellent for mule deer and chukar. Bighorn sheep are also available for hunting; a limited number of hunting permits are presently issued annually to manage approximately 200 sheep located east of the Owyhee Reservoir.

Special Features

The most distinguishing features of the Slocum Creek WSA are the picturesque geologic formations, which are Leslie Gulch ash-flow tuff and a part of the Sucker Creek formation.

The tuff is up to 2,000 feet thick. The spectacular cliffs and spires are due to the tuff's great thickness, uniformity, and relative resistance to weathering. The tuff is also exposed in the Honeycombs WSA (3-77A), the Dry Creek Buttes WSA (3-56) and the Blue Canyon WSA (3-73).

A number of the rock faces are dotted by spherical cavities of various sizes, giving them a honeycomb or sponge like appearance. Often these cavities widen to form caves and shelves which are overhung by fragile stone lips with smoothly flowing contours.

A relict stand of ponderosa pine is located along the crest of Blue Point Ridge in the Dago Gulch portion of the study area. When it was last counted in 1973, the population consisted of four mature trees around 400 years old and 45 young trees and seedlings. This is the only known relict stand of ponderosa pine in the Owyhee uplift and is of scientific importance because it may be evidence of a past moist climate.

Five plant species found in the WSA are of special interest. They evolved and depend on the specific conditions offered by the tuffaceous deposits. (These plants are further discussed in the Vegetation section.)

The rugged breaks and outcrops of this area are habitat for bighorn sheep. In November 1965, 17 bighorn sheep were reintroduced and have increased to approximately 200 animals.

A small disjunct population of Rocky Mountain elk resides year long on Mahogany Mountain south of the WSA. Elk use the WSA during the winter.

Northern bald eagles, federally listed as threatened in Oregon, winter in the Owyhee Reservoir area. (These birds are further discussed in the Wildlife section.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, the study area is in the Intermountain Sagebrush Province and has the potential natural vegetation of a sagebrush steppe. The WSA contains the low sagebrush/bluebunch wheatgrass plant community listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan.

Boise, Idaho is the only standard metropolitan statistical area with population over 100,000 within five hours' driving time of the study area.

Energy and Mineral Development

The energy and mineral resources were evaluated from available geologic data supplemented by limited geochemical stream sediment sampling by Oregon Department of Geology and Mineral Industries (DOGAMI) under BLM contract. This geochemical survey became the primary basis for the metallic minerals classification in the WSA . The DOGAMI report is entitled "Geology and Mineral Resources of 18 BLM Wilderness Study Areas, Harney and Malheur Counties, Oregon". Using the DOGAMI report, the study area was reevaluated by BLM personnel.

The WSA has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is considered to be moderately favorable for occurrence of oil and gas, gold, tin, bentonite, zeolite, perlite and pumice. Tin is a strategic and critical mineral; however, there are no known deposits of strategic and critical minerals in the WSA.

The mineral potential classifications for the WSA are shown in table 3.

Oil and gas is the main potential energy resource in the study area. Oil and gas potential will largely depend on the presence or absence of suitable marine rocks at depth. There has been no deep drilling in the vicinity that has penetrated the Tertiary volcanic cover.

As of January 1, 1984, there were no oil and gas or geothermal leases and no mining claims in the WSA.

The exposed rocks within the study area are Miocene or younger and include sedimentary tuffs, pumicites and silicic flows, flows and flow breccia of rhyolitic and rhyodacitic, dacitic composition. These rocks were deposited in a broad, north plunging basin that evolved in eastern Oregon and western Idaho beginning in the late Miocene.

Table 3. Classification of Energy and Mineral Potential, Slocum Creek WSA (OR-3-75)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, tin)	Entire WSA	3	B
Geothermal	Entire WSA	2	B
Uranium/Thorium	Entire WSA	1	B
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	B
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	3	B
Zeolites	Entire WSA	3	B
Perlite, Pumice	Entire WSA	3	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Vegetation

Vegetation throughout the area is characteristic of a sagebrush steppe ecosystem interspersed with pockets of juniper. A small population of ponderosa pine, unique to this vicinity, occurs in the WSA. The ecological successional stages of the vegetation would be predominantly a bluebunch wheatgrass/Wyoming big sagebrush community, with Idaho fescue a component of the community in a small part of the area.

The following plant species of special interest (mentioned in the Special Features section) are found in the WSA: *Astragalus sterilis* (sterile milkvetch); *Ivesia rhypara* (grimy ivesia); *Mentzelia packardiae* (Packard's stickleaf/mentzelia); *Senecio Ertterae* (Ertter's ragwort/senecia); *Trifolium Owyheense* (Owyhee clover). These plants are candidate species for federal listing as threatened or endangered and occur on the tuffaceous ash soils in the area.

Wildlife

California bighorn sheep occupy virtually all of the area yearlong.

Large numbers of mule deer winter in the study area. Several hundred head normally use the western part of the WSA, which usually remains free of heavy snow accumulations.

Northern bald eagles pass through the area in their annual spring and fall migrations. Some birds winter on Owyhee Reservoir as long as open water persists. A total of 20 to 30 bald eagles utilize the Owyhee Reservoir and River area.

An existing wildlife project in the WSA (among the man-made features listed in the Naturalness section) is a wildlife guzzler near the center of the study area.

Livestock Grazing

A portion of the Three Fingers grazing allotment is located within the study area. Table 4 summarizes existing and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and calf, or equivalent animals, for one month).

Existing livestock projects in the WSA include the two fences mentioned in the Naturalness section. Two spring developments are proposed for the WSA. They would make available an additional 40 AUMs in licensed use in the Three Fingers allotment.

Vehicles are presently used in the WSA to place salt, and in conjunction with horses, to check livestock. Horses are used to move cattle to and from the area.

Recreation Use

Hunting opportunities are excellent as populations of mule deer and chukars are plentiful; a few hunting permits are issued annually for bighorn sheep.

Recreational use of the WSA is limited but is increasing along with the increased use of the Owyhee Reservoir. Some people using Owyhee Reservoir do some day hiking in the study area as a diversion from water related recreation.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 356 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $2,684 annually, and local personal income generated by existing outputs amounts to $5,724 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Table 4. Existing and Potential Livestock Use, Slocum Creek WSA (OR-3-75)

Grazing Allotment	Licensed Aums in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Three Fingers (No. 0503)	12,420	03/20-05/20	2	356	40

[1]The increases might or might not result in licensed use in the allotment (see narrative).

Effects on Wilderness Values

Under the **all wilderness alternative**, all 7,600 acres in the Slocum Creek WSA would be added to the National Wilderness Preservation System (NWPS).

The Slocum Creek WSA would make an important contribution to expanding the diversity of the NWPS. It would include spectacular geological formations, a relict stand of ponderosa pine, five plant species of special interest, outstanding scenic quality, and habitat for bighorn sheep and northern bald eagles. The pine stand, the unusual rock formations and the fragile soils which support a variety of rare plants are examples of distinctive ecological settings with high values for educational and scientific activities. Opportunities for primitive recreation and solitude would be preserved.

Naturalness would be enhanced by closure of the way, allowing it to revegetate.

Under the **no wilderness/no action alternative**, the use of motorized vehicles and equipment to maintain the wildlife guzzler and range fence, as well as use of vehicles for livestock management would continue. Such vehicle use would prevent ways from revegetating and returning to a more natural condition.

Under the no wilderness/no action alternative, any mineral development could adversely affect the area's special wilderness features and opportunities for solitude and primitive recreation. Some adverse effects from oil and gas or geothermal lease development could be mitigated through lease stipulations.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. The **all wilderness alternative** would withdraw 7,600 acres, including the areas rated moderate for metals, oil and gas, bentonite, zeolite, perlite, and pumice, which encompass the entire WSA.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the two proposed spring developments might or might not be allowed depending on a site-specific analysis of whether they conform with Wilderness Management Policy. If not allowed, 40 AUMs of available forage could not be utilized.

The benefit/cost ratio for these projects is less than 1:1.

The all wilderness alternative also would limit the use of motorized equipment and vehicles for salting and checking animals.

Under the **no wilderness/no action alternative**, the spring developments would be allowed and the 40 AUM forage increase would be realized.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the spring developments proposed for this WSA, would be constructed if the area were designated wilderness.

Currently, there is little dependence on vehicles for livestock management in the study area. There would be no impact and no increase in cost to the grazing operator in the WSA from road closures.

The effects of the alternatives are shown in two columns in the tables. The column for the all wilderness alternative shows the effects as a range of values dependent upon whether structural improvements were allowed.

Table 5. Effects of Alternatives on Annual Economic Value, Slocum Creek WSA (OR-3-75) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +40	+40
VALUE OF PLANNED INVESTMENTS [2]			
Grazing	$	0 to +302	+302
Investments [3]	$	0 to -306	-306
Net Economic Value [4]	$	-4 to 0	-4

[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $3,800 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[4] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative values as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

Table 6. Effects of Alternatives on Local Personal Income, Slocum Creek WSA (OR-3-75) (1981 price levels)

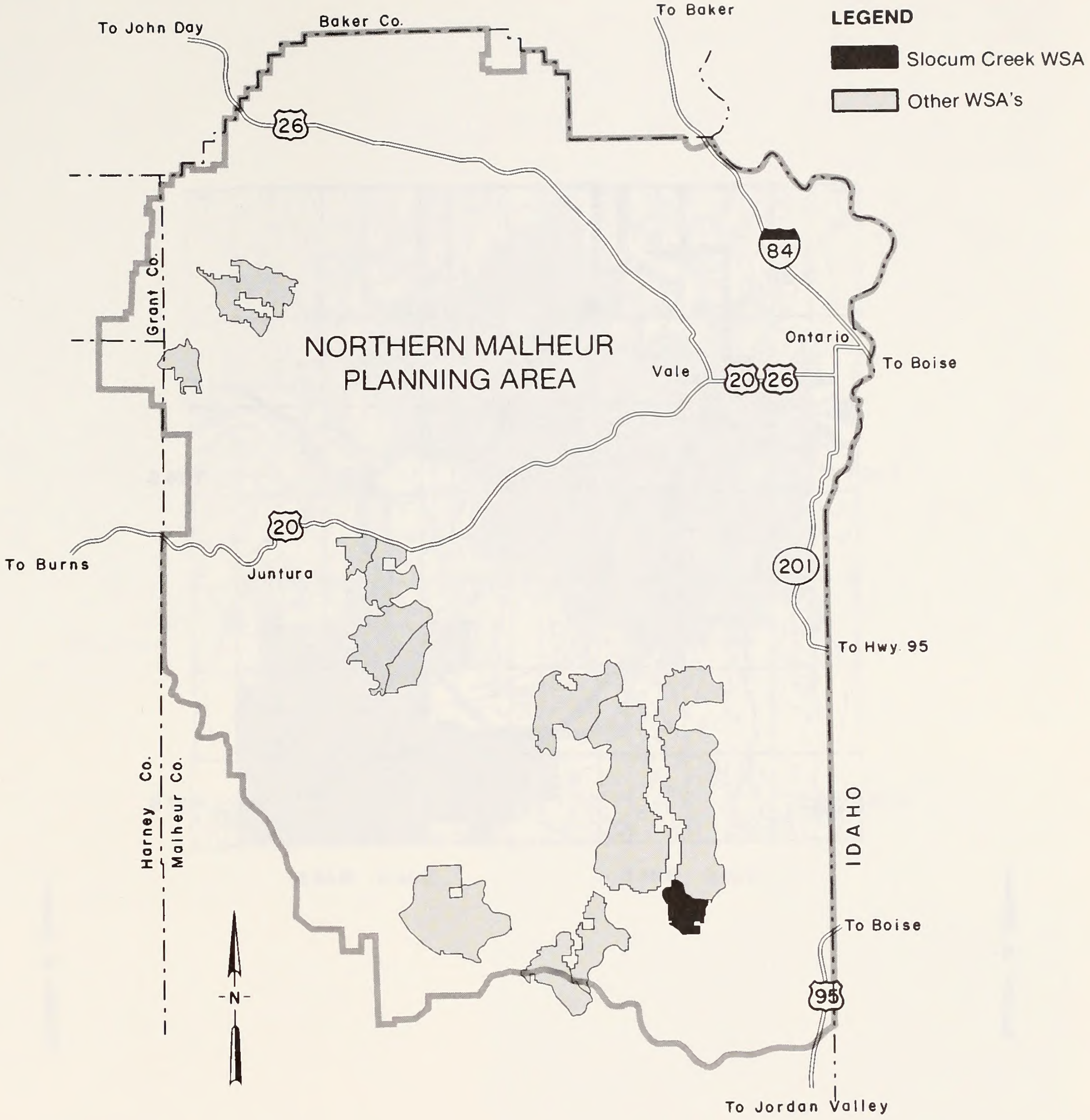
Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +40	+40
INCOME FROM PROPOSED INVESTMENTS [2]			
Grazing	$	0 to +643	+643
Construction activity [3]	$	0 to +523	+523
Total [4]	$	0 to +643	+643

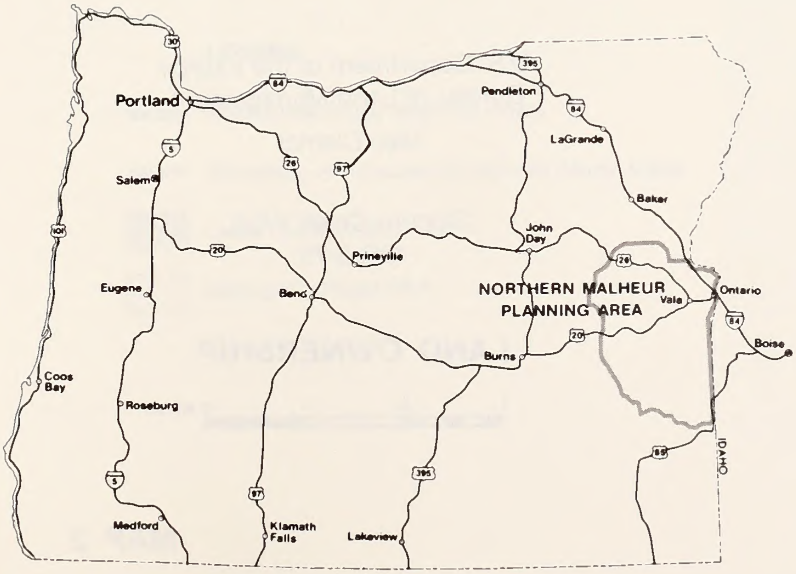
[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $3,800 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.





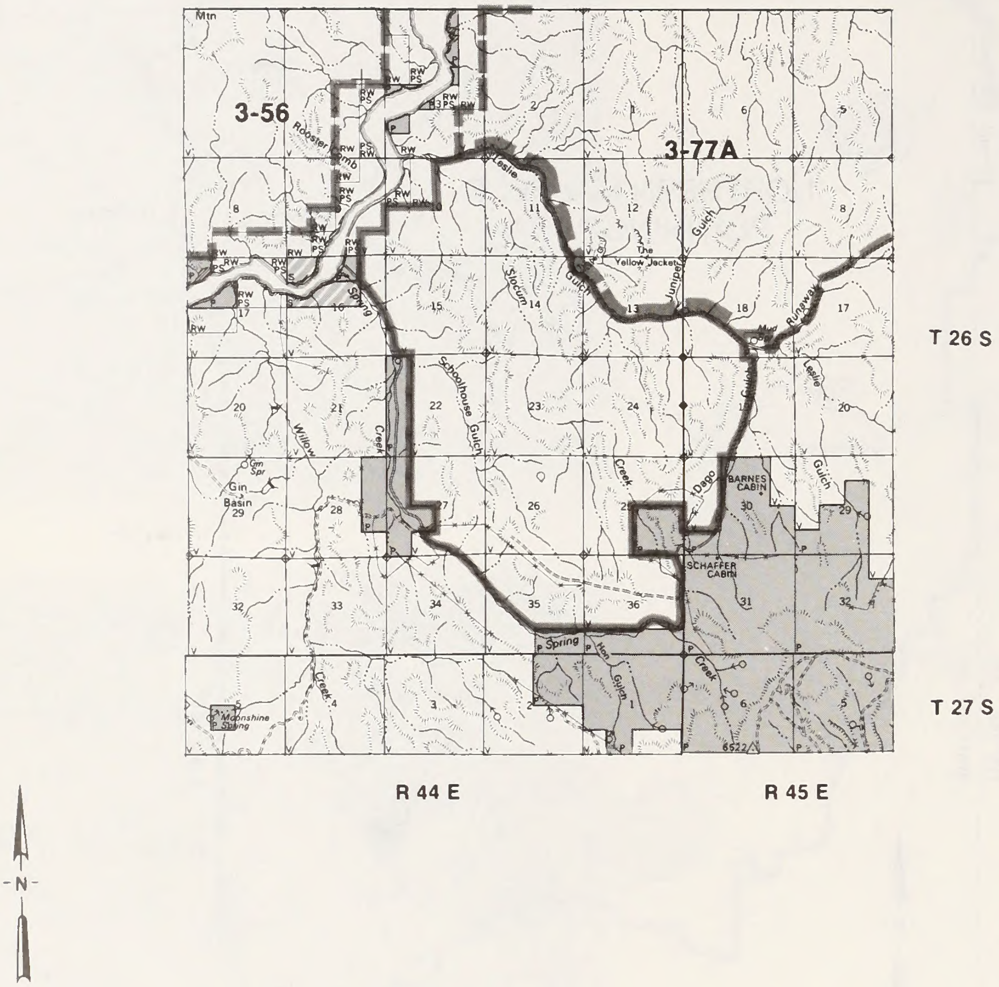
U.S. Department of the Interior
Bureau of Land Management
Vale District

Slocum Creek WSA
OR-3-75

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▨ State
- ■ Private

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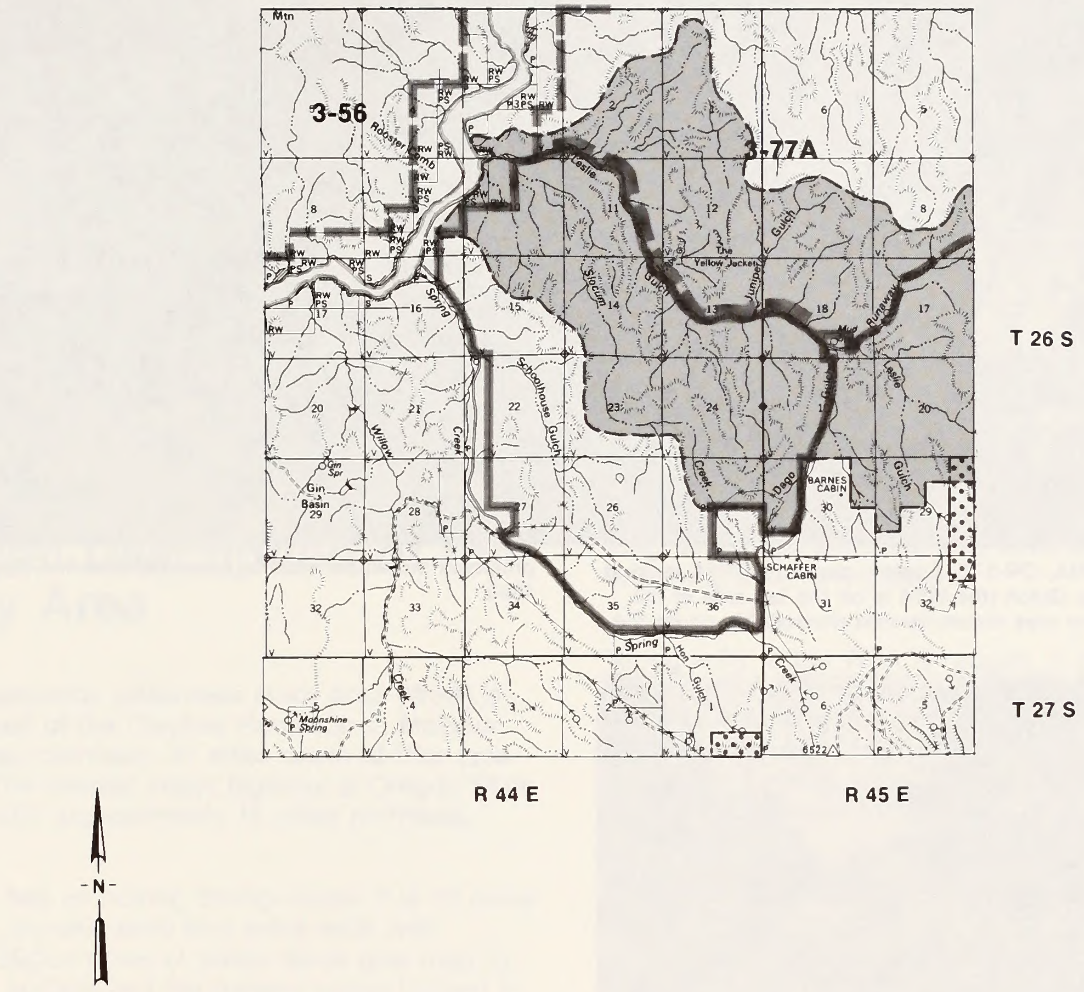
Slocum Creek WSA
OR-3-75

LAND OWNERSHIP

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

╌ Boundary of Adjacent Wilderness Study Areas

▨ Leslie Gulch ACEC

⁘ Mahogany Ridge RNA

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Slocum Creek WSA
OR-3-75

AREA OF CRITICAL ENVIRONMENTAL CONCERN & RESEARCH NATURAL AREA

1 0 1 2 MILES

MAP 3

Slocum Creek WSA, OR-3-75. Eastern portion of WSA looking north down Dago Gulch (the WSA is on the left side of the photo). Within the area recommended nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Slocum Creek WSA, OR-3-75. Eastern portion of WSA looking south at a ridge containing ponderosa pine. Within the area recommended nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Honeycombs Wilderness Study Area (OR-3-77A)

General Description of the Study Area

The Honeycombs wilderness study area (WSA) is located east of the Owyhee Reservoir in Malheur County, approximately 31 miles south of Vale (see map 1). The nearest major highway is Oregon State Highway 201 approximately 15 miles northeast.

The area has an oblong configuration. It is 16 miles long and approximately four miles wide and contains 39,000 acres of public lands (see map 2). All of the surface and the mineral estate located in the WSA is publicly owned.

The boundary consists of BLM roads on the south, east and north. The west border abuts public land administered by the Bureau of Reclamation and the State of Oregon. A 40-acre plot of private land is located in the Mud Springs area along the study area's southern border.

Three dead-end roads enter the WSA, forming part of the boundary. A 1 3/4-mile-long road to a horsetrap in the Sheephead Basin area enters the WSA from the north. A 3-mile-long road enters the area at Craig Gulch and terminates at Three Fingers Gulch. A 2 1/2-mile-long branch of this road, crosses Shadscale Flat, and ends at Shadscale Spring. The third road, 3/4 of a mile long, enters the area one mile north of Craig Gulch and ends at a mining claim.

Topography in the WSA is rugged. A thick deposit of volcanic tuff is cut by numerous intermittent streams, resulting in a broken surface of ridges, hills and drainages, with frequent outcroppings and pinnacles. Several areas of relatively level land are found in Shadscale Flat and Sheepshead Basin.

Sagebrush and grasses are the predominant plants in the area.

In the northern part of the WSA is an area of approximately 12,000 acres called the Honeycombs. The Honeycombs are an area of steep-walled canyons with exposed, multi-colored rock formations of volcanic origin.

Interrelationships

The Honeycombs WSA is adjacent to the Wild Horse Basin WSA (OR-3-77B) on the north and the Slocum Creek WSA (OR-3-75) on the southwest. The WSAs are separated by roads.

Land administered by the Bureau of Reclamation in connection with its management of the Owyhee Reservoir lies between the west side of the WSA and the reservoir. Numerous recreational cabins are located on leased sites on this adjacent land. Most cabins are reached by boat only. These cabins are located on both sides of the Owyhee Reservoir and are generally within 1/2 mile of the WSA boundary.

Also adjoining the west side of the WSA, for one mile, is State of Oregon land.

The Honeycombs Area of Critical Environmental Concern (ACEC) and Research Natural Area (RNA) are entirely within the WSA, and a portion of the Leslie Gulch ACEC is located in the study area (see map 3). The Honeycombs ACEC and RNA have an identical boundary and contain 11,930 acres. Approximately 3,870 acres of the Leslie Gulch ACEC is located in the southern end of the WSA. The ACECs and RNA were designated to protect bighorn sheep, volcanic formations, and the fragile soils and plants endemic to the sites.

The Honeycombs ACEC and RNA include the following special management restrictions:

- continuation of grazing, managed to enhance or maintain existing vegetation, and

- no new range improvements allowed unless needed to protect ACEC or RNA values.

In addition to these restrictions for the ACEC/RNA, BLM has designated the area as an off-road vehicle (ORV) closure. The boundary of the closure is the same as the ACEC/RNA.

The Leslie Gulch ACEC includes the following special management restrictions:

- continuation of grazing, managed to enhance or maintain existing vegetation,

- no new range improvements allowed unless needed to protect ACEC values,

- ORVs restricted to existing routes.

In addition to these restrictions, and unrelated to the ACEC or RNA management restrictions, there is a no-surface occupancy restriction for mineral leases within sight of the Owyhee Reservoir.

These restrictions that currently apply to the affected lands within the WSA would continue to apply whether or not the area is designated wilderness.

Most of the WSA is in the Three Fingers wild horse herd management area (HMA). HMA management, including use of a horsetrap site, will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- the area's mineral potential and the potential for mineral development,

- the interior dead-end roads and their possible closure,

- the effect of the Leslie Gulch cabin on the WSA's naturalness, and

- disturbed areas in the WSA (Craig Gulch, Sheepshead Ridge, and the areas along the eastern boundary).

Also raised as an issue was the possibility of combining this WSA with adjacent and nearby WSAs into a single wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- partial (preferred alternative)
- no wilderness/no action

An enhanced wilderness alternative, which would combine this WSA with the Wild Horse Basin WSA and the Slocum Creek WSA is not analyzed because the roads separating the WSAs provide essential access to Owyhee Reservoir for recreationists and owners and users of resort cabins. An enhanced wilderness alternative which would close the dead-end roads in the WSA is not analyzed because road closure is addressed in the partial alternative.

Public comments received while the EIS was being scoped suggested that this WSA be combined with the Wild Horse Basin, Slocum Creek, Dry Creek (OR-3-53) and Dry Creek Buttes (OR-3-56) WSAs and the former Upper Leslie Gulch WSA (OR-3-74A) into a single wilderness area. This is not analyzed because the former Upper Leslie Gulch WSA is no longer subject to wilderness review and because the Dry Creek and Dry Creek Buttes WSAs are separated from the Honeycombs WSA by Owyhee Reservoir. The reservoir and adjacent lands are managed by the Bureau of Reclamation and are not subject to wilderness review.

All Wilderness

Under the all wilderness alternative, all 39,000 acres in the WSA would be recommended suitable as wilderness (see map 2). For purposes of analysis, it is assumed the three dead-end roads in the WSA would remain open to motor vehicles.

Partial (Preferred Alternative)

Under the partial alternative, approximately 36,300 acres would be recommended suitable as wilderness (see map 4). Craig Gulch and several small areas along the eastern boundary, where mineral activity has resulted in surface disturbance, would be recommended as nonsuitable for wilderness designation. An area containing a concentration of existing range projects around Sheepshead Ridge in the northeast corner of the WSA would also be recommended as nonsuitable. Total area recommended nonsuitable under this alternative would be about 2,700 acres.

The road and its two branches in Shadscale Flat would be closed. The dead-end road leading to the horsetrap in the northeastern portion of the WSA would be a part of the boundary of the wilderness area and would remain open.

Along the eastern side, the boundary between the suitable and nonsuitable portions would follow a ridgeline west of Craig Gulch. In the area near Sheepshead Ridge, the boundary between the suitable and nonsuitable portions would follow a fenceline on the west side of Sheephead Ridge to the dead-end road leading to the horsetrap, along this road to a prominent rim, along the rim to a fence, and along the fence to the north boundary of the WSA.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development, except no surface occupancy on leases in sight of Owyhee Reservoir,
- continued restriction of vehicles to existing routes, except in the Honeycombs area closure where totally prohibited,
- construction of livestock improvement projects, including two spring developments, and,
- use of a community gravel pit along the east boundary of the WSA.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The areas recommended suitable under both the all

Table 1. Summary of Proposed Management Under Each Alternative, Honeycombs WSA (OR-3-77A)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	39,000	36,300	0
Acres Closed to ORVs by Wilderness Designation [1]	27,070	24,370	0
Miles of Roads Closed	0	4.8	0
Miles of Ways Closed	8	6	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	39,000	36,300	0
Structural Livestock Projects Developed: Springs (number)	0-2	0-2	2

[1] Approximately 11,930 acres in the WSA are already closed to ORV use under the current land use plan.

Table 2. Summary of Environmental Consequences of Alternatives, Honeycombs WSA (OR-3-77A)

Resource or Activity	All Wilderness	Partial (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 39,000 acres to NWPS and preserve naturalness, outstanding opportunities for solitude and primitive recreation, colorful land forms, bighorn sheep habitat for bald eagles, and plant species of special interest. Vehicle use on dead-end roads would adversely affect opportunities for solitude and primitive recreation. Closure of 8 miles of ways would enhance naturalness and opportunities for solitude and primitive recreation. If mining claims were determined to be valid, mining activity could adversely affect wilderness values. The area would be manageable as wilderness.	Would add 36,300 acres to the NWPS. In portion designated wilderness, effects on wilderness values would be similar to all wilderness alternative. Closure of 6 miles of ways and 4.8 miles of dead-end roads would enhance wilderness values. The area would be manageable as wilderness. In the 2,700 acres recommended as nonsuitable for wilderness, mining activities and the use of motor vehicles would continue to adversely affect wilderness values.	Mining activities could adversely affect wilderness values anywhere in WSA. Vehicle use would continue to adversely affect wilderness values except where such use is restricted by ACEC and RNA designations or by ORV closures.
Energy and Mineral Development	Development precluded on 39,000 acres, including 39,000 acres with moderate potential for oil and gas, gold and silver, bentonite and perlite.	Development precluded on 36,300 acres, including 36,300 acres with moderate potential for oil and gas, gold and silver, bentonite, and perlite.	No impact.
Livestock Grazing	No change in existing management. An increase of up to 40 AUMs and better distribution of livestock would be foregone if two proposed spring developments are not allowed.	Same as all wilderness.	No change in existing management. Increase of 40 AUMs and better distribution of livestock realized through development of two springs.
Recreation Use	Enhances primitive recreation by closing ways to vehicle use. Reduction in vehicle-oriented recreation. Slight net increase in overall recreation.	Slight reduction in vehicle-oriented recreation, offset by increases in primitive recreation. Overall recreation use would not change.	No change in recreation use.
Economic Value and Local Income	Decrease in annual economic value could range from $6,720 to $6,724, depending on what proposed projects would be allowed in wilderness. Decrease in local personal income could range from $1,381 to $2,024, depending on the same uncertain factors. Both sets of figures include loss of oil and gas leases, and exclude unknown economic effects of mineral development and unquantified changes in recreation use.	Decrease in annual economic value could range from $2,186 to $2,190 depending on what proposed projects would be allowed in wilderness. Changes in local personal income could range from a loss of $638 to a gain of $5 depending on the same uncertain factors. Both sets of figures include loss of oil and gas leases, and exclude unknown economic effects of mineral development and unquantified changes in recreation use. The maximum increase in transportation costs to livestock operators would be $66.	Decrease in economic value by $4 and increase in local personal income by $643 from construction of all proposed projects.

wilderness and partial alternatives are manageable as wilderness. Under the all wilderness alternative, there would be manageability problems with continued development of mining claims along the eastern boundary, continued use of the road through Shadscale Flat, maintenance of the range projects around Sheepshead Ridge, and continued use of the horsetrap road.

Rationale for Selection of the Preferred Alternative

The partial alternative is preferred because it would designate as wilderness areas with many wilderness values and minimal conflicts with wilderness designation; it would recommend areas with significant conflicts and few wilderness values as nonsuitable for wilderness designation.

Wilderness values within the area recommended suitable include the Leslie Gulch volcanic tuff geologic formation, a high concentration of plants of special interest, bighorn sheep habitat, critical deer winter range, excellent raptor habitat, excellent reptile habitat, unique ecological interrelationships, superb scenery, excellent opportunities for educational and scientific study, and outstanding opportunities for primitive recreation and solitude. The benefits of preserving these values would outweigh the benefits of keeping the area open for exploration and development of minerals. (The entire area has a moderate potential for oil and gas and much of the area has a moderate potential for metals.)

The areas not recommended for wilderness designation (2,700 acres) have been disturbed by mining and do not have the variety of wilderness values that exists in the rest of the study area. Mineral development would likely continue on the existing claims along the eastern boundary and in Craig Gulch. This alternative would allow unrestricted use and maintenance of the range projects concentrated around Sheepshead Ridge.

Closing the roads in Shadscale Flat, as proposed under the partial alternative, would enhance the area's naturalness, bighorn sheep habitat, primitive recreation and opportunities for solitude.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The area is in a generally natural condition. The rugged terrain and resulting lack of access has limited the number of man-made features in the WSA. The majority of the WSA is unaffected by man-made features.

A total of 47 man-made features influence approximately 6 percent of the WSA. (The area of influence is an estimate of the acreage within the WSA from which the man-made features can be seen.) There are 8 miles of ways (vehicle routes established and maintained solely by the passage of vehicles), 2 reservoirs, 3 springs, 1 pipeline, 8 sites of mining activity, 1 horsetrap and remnants of 5 old abandoned horsetrap sites, 4 wildlife guzzlers (small wildlife watering devices), 5 fences, and ORV closure signs installed by BLM.

Nearly all of these man-made features are concentrated along the northern, eastern and southern boundaries and the road leading to Three Fingers Gulch and Shadscale Flat. The most heavily influenced areas are the east facing slopes of Sheepshead Ridge and the ridge west of Craig Gulch. The least influenced areas are the Honeycombs and the portion of the WSA south of the dead end-road to Three Fingers Gulch and Shadscale Flat.

Major outside sights and sounds which affect naturalness inside the WSA include the Leslie Gulch road, a cabin in Leslie Gulch, the Owyhee Reservoir recreational cabins located along Owyhee Reservoir, and the Pelican Point airstrip. These man-made features cumulatively affect only a small portion of the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude and primitive recreation in the WSA are outstanding. The major factor contributing to the outstanding opportunities for solitude is the topographic screening provided by the steep and diverse terrain found in 84 percent of the WSA. The numerous canyons, gulches, draws, and ridges provide innumerable secluded areas and locations. The remaining 16 percent of the WSA (Shadscale Flat, Sheepshead Basin, and an unnamed basin north of Three Fingers Gulch) contains moderately diverse terrain. The elongated shape and large size of the WSA further enhance the opportunities for solitude.

The area offers outstanding day hiking opportunities. Areas with day hiking opportunities are dispersed throughout the WSA, providing recreationists with a number of choices. Probably the most popular areas would be those directly off the Leslie Gulch Road, such as Juniper Gulch, Timber Gulch, and several unnamed drainages.

Other popular areas would be the numerous drainages that are accessible from the northern and eastern boundary roads. The most popular routes would be those providing access to the impressive geologic formations located in the Honeycombs. The Honeycombs is one of the most scenic parts of the WSA and provides good bighorn sheep and raptor habitat.

Boaters on the Owyhee Reservoir are also potential hikers in the WSA because it is accessible by water. Perhaps the most attractive water access points would be the mouth of Carlton Canyon, Bensley Flat, and the Iron Mountain area. Of these, Bensley Flat would probably receive the most use due to its location at the base of the Honeycombs.

The WSA offers outstanding opportunities for backpacking because of its size, availability of numerous routes and access points, numerous scenic areas, and numerous level campsites. However, scarcity of drinking water is a substantial drawback for backpackers.

The WSA offers outstanding opportunities for hunting due to the availability of bighorn sheep, mule deer, and chukars.

The WSA also offers outstanding opportunities for photography and sightseeing because of the scenic geologic formations and endemic plants.

Special Features

The Honeycombs WSA contains spectacular geologic formations created by weathering of the Leslie Gulch tuff. The tuff is perhaps as much as 2,000 feet thick and is exposed throughout the area. The spectacular cliffs and spires are due to the great thickness and uniformity of the tuff and the relative resistance of the tuff to weathering. The tuff also is exposed in the Slocum Creek WSA (OR-3-75), the Dry Creek Buttes WSA (OR-3-56), and the Blue Canyon WSA (OR-3-73).

A number of the rock faces are dotted by spherical cavities of various sizes, giving them a honeycomb or sponge-like appearance. Often these cavities widen to form caves and shelves which are overhung by fragile stone lips with smoothly flowing contours. Numerous outcrops, rims, and pinnacles are distributed throughout the WSA, mostly in Leslie Gulch, Honeycombs, Painted Canyon, and Carlton Canyon, creating a landscape of stark beauty. The scenery is outstanding.

There are six plant species in the WSA which are of special interest. (These plants are discussed further in the Vegetation section.)

The rugged breaks and outcrops of this area form part of the Owyhee river bighorn sheep range. These animals, native to the Leslie Gulch area, were reintroduced into Leslie Gulch in November 1965, and approximately 200 animals now roam the rocky areas east of the Owyhee Reservoir. A thriving bighorn sheep herd in its natural habitat is noteworthy. (The Wildlife section further discusses the bighorn sheep.)

Northern bald eagles, federally listed as threatened in Oregon, pass through the area in their annual spring and fall migrations. Some eagles winter along Owyhee Reservoir in some years. (The birds are discussed further in the Wildlife section.)

The WSA is part of BLM's Three Fingers wild horse herd management area (HMA). There are approximately 200 wild horses in the Three Fingers HMA. However, the horses use range in the WSA only to a limited extent. Currently, BLM intends to maintain a herd of between 90-150 wild horses in the Three Fingers HMA, with periodic gatherings on a four-year cycle to attain this objective.

Juniper Gulch, located at the south end of the WSA, contains a large variety of plants and many junipers. The gulch also contains many of the geologic formations unique to the area and at least two species of unusual plants. The gulch is one of the most ecologically complex sites in the WSA.

Diversity of the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, the Honeycombs WSA is located in the Intermountain Sagebrush Province and has the potential natural vegetation of a sagebrush steppe. The WSA contains two plant communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan: big sagebrush/bluebunch wheatgrass and big sagebrush/Idaho fescue.

Boise, Idaho is the only standard metropolitan statistical area with a population over 100,000 within 5 hours' driving time of the WSA.

Energy and Mineral Development

Because most of the available mineral data was very general, Oregon Department of Geology and Mineral Industries (DOGAMI) did reconnaissance geochemical surveys of 18 WSAs under a BLM contract. This geochemical survey became the primary basis for the metallic minerals classification for this WSA. Technical details of the findings of the evaluation are incorporated in a DOGAMI report titled "Geology and Mineral Resources of 18 BLM Wilderness Study Areas, Harney and Malheur Counties, Oregon". Using the DOGAMI report and a heavy mineral analysis conducted by Barringer Resources, Inc., the study area was reevaluated by BLM geologists.

The area has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is considered to be moderately favorable for oil and gas and for gold and silver. The classification level for these metals (3) has different confidence levels in different portions of the WSA (see map 5). Silver is a strategic and critical mineral; however, there are no known deposits of strategic and critical minerals in the WSA. The entire WSA also has moderate favorability for bentonite and perlite.

The mineral potential classifications for the WSA are shown in table 3. Map 5 shows the portions of the WSA rated moderate (medium) for metals, but with different confidence levels (i.e., 3B and 3C).

Table 3. Classification of Energy and Mineral Potential, Honeycombs WSA (OR-3-77A)

Commodity	Area	Classification Level	Confidence Level
Metals gold, silver,	See map 5	3	C
	Rest of area	3	B
mercury	Entire area	2	C
Geothermal	Entire WSA	2	B
Uranium/Thorium	Entire WSA	2	B
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	3	B
Diatomite	Entire WSA	1	B
Zeolites	Entire WSA	2	C
Optical Calcite	Entire WSA	2	C
Perlite	Entire WSA	3	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Oil and gas is the main potential energy resource in the area and is largely dependent on the presence or absence of suitable marine rocks at the subsurface. There has been no deep drilling in the vicinity which has penetrated the Tertiary volcanic cover.

As of January 1, 1984, there were two oil and gas leases covering about 6,720 acres in the northern part of the WSA, and no geothermal leases. There were 51 mining claims along the eastern edge of the WSA, which are associated with picture rock and jasper. These materials can be indicative of gold deposits.

The land use plan designates a community gravel pit along the east boundary of the WSA. No material has been removed from the site.

All the exposed rocks within the area are Miocene or younger and include rhyolite and basalt flows, air-fall and ashflow tuffs, and tuffaceous sedimentary rocks. There are also areas underlain by a variety of Pleistocene and Recent superficial sediments. The rocks were all deposited in a broad, north plunging basin or basins that evolved in eastern Oregon and western Idaho beginning in the late Miocene.

Vegetation

Vegetation throughout the area is characteristic of a sagebrush steppe ecosystem. The ecological successional stage of the vegetation ranges from mid to late seral. (Seral refers to the stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) Pockets of juniper are scattered throughout the WSA. The climax vegetation would be a bluebunch wheatgrass/Wyoming big sagebrush community, although localized areas would support an Idaho fescue/Wyoming big sagebrush community.

Six plant species of special interest are found in the WSA (mentioned in the Special Features section). Five of these are candidates for federal listing as threatened or endangered: *Astragalus sterilis* (sterile milk vetch); *Astragalus solitarius* (solitary milk vetch); *Mentzelia Packardiae* (Packard's stickleaf); *Senecio Ertterae* (Ertter's ragwort); and *Trifolium Owyheense* (Owyhee clover). These plants depend upon the specific soil conditions formed by the area's unique tuffaceous ash deposits.

A sixth plant species, *Argemone munita*, is on List 2 of the Oregon Natural Heritage Plan's 'Rare, Threatened, and Endangered Plants and Animals of Oregon.'

Wildlife

Approximately 200 California bighorn sheep occupy the area east of the Owyhee Reservoir. These animals, native to the Leslie Gulch area, were numerous until 1900-1915 when disease and competition with domestic sheep caused their disappearance. In November of 1965, 17 bighorn sheep were reintroduced to their traditional Leslie Gulch range. The resultant herd is healthy and expanding in numbers. This area is one of only five areas in Oregon where bighorn sheep are found in the wild.

The western flanks of the WSA contain a crucial mule deer winter range. Roughly 850 deer use the area in a typical winter season.

Four guzzlers (small wildlife watering devices) are located in the WSA.

Northern bald eagles are spring and fall migrants in this area. Open water on Owyhee Reservoir attracts a variety of waterfowl which are believed to be the primary food source for eagles. A total of 20 to 30 eagles utilize the Owyhee Reservoir and River area. Some birds winter on Owyhee Reservoir as long as open water persists.

Livestock Grazing

A portion of one grazing allotment is located within the WSA. Table 4 shows existing livestock use in AUMs (animal unit months), the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Existing livestock projects (among the man-made features listed in the Naturalness section) are 2 reservoirs, a pipeline, 5 fences and 3 spring developments.

Two spring developments are proposed inside the WSA, which would provide better livestock distribution and an additional 40 AUMs to the allotment.

Vehicles are presently used by livestock operators to place salt and to check livestock and the existing spring developments. Such traffic is minor due to the small number of ways and roads into the area. Horses are used to move cattle to and from the area.

Recreation Use

Day hikers and backpackers currently visit this WSA. Most hiking routes originate in Leslie Gulch because of its well-maintained road. The Honeycombs area is a popular destination because it is one of the most scenic parts of the WSA.

Hunters frequent this WSA for bighorn sheep, mule deer and chukars. The most unique game species is bighorn sheep. A very limited number of hunting permits for bighorn sheep are issued annually.

Hunters use the dead-end road for access into the Three Fingers Gulch and Shadscale Flat area. Except for the way along the southern boundary, very little vehicle use for recreation occurs on the ways in this WSA.

The excellent fishing and boating on nearby Owyhee Reservoir bring people into the area, who take advantage of its primitive recreation opportunities.

Table 4. Existing and Potential Livestock Use, Honeycombs WSA (OR-3-77A)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Three Fingers (No. 0503)	14,743	Sept-May	20	1,755	40

[1] Increase might or might not result in increased licensed use in the allotment (see narrative).

Economic Conditions

Livestock grazing, oil and gas leasing, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 2 oil and gas leases and no geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add all 39,000 acres of the WSA to the National Wilderness Preservation System (NWPS). Designation of the Honeycombs WSA as a wilderness area would expand the diversity of the NWPS and would preserve the colorful volcanic tuff deposits that cover the area, the bighorn sheep habitat, crucial winter range for mule deer, winter habitat for northern bald eagles, a number of unusual plants (including six species of special interest), distinctive ecological relationships found in the unusual soils and plant communities, excellent opportunities for education and scientific studies, the area's outstanding scenery, and the outstanding opportunities for solitude and primitive recreation.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Honeycombs WSA (OR-3-77A) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	1,755	$13,233	$28,220
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil & Gas Leases	Acres	6,720	6,720	2,024
Total			19,953	30,244

Because the three dead-end roads would remain open under the all wilderness alternative, motorized vehicles and equipment would continue to have access to some of the man-made features. These include a horsetrap site, several mining claims, a wildlife guzzler, a developed spring and a reservoir. Vehicle use on the dead-end road would adversely affect opportunities for solitude and primitive recreation. All of the 8 miles of ways in the WSA would be closed to vehicles, except that motorized equipment may be used to maintain rangeland projects if there were no practical alternatives. The closures would enhance the naturalness and opportunities for solitude and primitive recreation in the WSA.

If claimants discovered a valuable mineral deposit before wilderness designation, continuation of mining activity would adversely affect the naturalness of the eastern portion of the WSA where the majority of the mining claims are located.

The **partial alternative** would add 36,300 acres to the NWPS. It would afford the same protection in the area recommended suitable as the all wilderness alternative. Closure of 6 miles of ways and 4.8 miles of dead-end roads would enhance wilderness values. This alternative would exclude the areas where man-made feature are concentrated, including the Sheephead Ridge area, Craig Gulch area, and existing mining claims with disturbed areas located along the eastern boundary. Mining activities and the use of motor vehicles would continue to adversely affect wilderness values in these areas.

The branched dead-end road into Three Fingers Gulch and Shadscale Flat would be closed to vehicles, thus enhancing the naturalness and opportunities for solitude and primitive recreation in this portion of the WSA.

Under the **no wilderness/no action alternative**, and in the portions recommended nonsuitable under the partial alternative, mineral exploration and development would be allowed. (Surface occupancy on leases would continue to be restricted; claim development would be allowed.). Any mineral development could adversely affect wilderness values, including the area's special wilderness features and opportunities for solitude and primitive recreation. Some adverse effects from oil and gas or geothermal lease development could be mitigated through lease stipulations.

Under the no wilderness/no action alternative, wilderness values would be adversely affected by the continued use of motor vehicles except where such use is already restricted by the ACECs, RNA and ORV closures. In the rest of the WSA, use of motorized vehicles and equipment for the maintenance of range projects and the management of livestock would continue to adversely affect wilderness values.

The community pit would be used, which would reduce wilderness values in the immediate vicinity of the pit.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 39,000 acres under the **all wilderness alternative**, and 36,300 acres under the **partial alternative**. This would include the areas rated moderate for oil and gas, gold and silver, bentonite, and perlite, which encompass the entire WSA.

Also, use of the designated community gravel pit would be precluded under this alternative.

No acreage would be withdrawn by wilderness designation under the **no wilderness/no action alternative**.

Effects on Livestock Grazing

Under the **all wilderness and partial alternatives**, the two proposed spring developments might or might not be constructed, depending on a site-specific analysis to determine whether they conform with Wilderness Management Policy. If they are not allowed, an opportunity to improve livestock distribution and increase licensed forage by an additional 40 AUMs in the allotment would be foregone.

The spring developments have a benefit/cost ratio less than 1:1.

Under the **no wilderness/no action alternative**, the two springs would be developed and the increase of 40 AUMs and better livestock distribution in the allotment would be realized.

The road through Shadscale Flat is currently used by livestock operators to place salt and to check livestock. Under the all wilderness and no wilderness/no action alternatives, the current use of motorized vehicles would continue along this road. Under the partial alternative the road would be closed and vehicle use prohibited unless there were no practical alternatives to using vehicles.

Effects on Recreation Use

The **all wilderness alternative** would preserve and enhance primitive recreation by closing the ways to vehicles. Hunters could continue to use the dead-end roads for access into the WSA and day hunts for both big game and game birds would be possible within the study area. Except for the closure of the way near the southern boundary, this alternative would not reduce recreation use. Overall recreational use of the area would increase slightly.

Under the **partial alternative**, the dead-end road through Shadscale Flat to Three Fingers Gulch would be closed to vehicles, so vehicle-oriented hunting would decline. The road closure would enhance opportunities for solitude and primitive recreation in the southern half of the WSA. Overall recreational use would probably remain the same.

Under the **no wilderness/no action alternative**, the ORV closure and the two ACECs would help to protect existing primitive recreational values. Continued mineral development and increased use of ORVs outside of the closure area would reduce both opportunities for solitude and primitive recreation. Overall recreation use would not change.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the two spring developments proposed for this WSA, would be constructed if the area were designated wilderness.

The columns for the **all wilderness and partial alternatives** show the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access were allowed.

Table 6. Effects of Alternatives on Annual Economic Value, Honeycombs WSA (OR-3-77A) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing: Investment [1]	AUM	0 to +40	0 to +40	+40
Oil and Gas Leases	Acres	-6,720	-2,120	0
VALUE OF PLANNED INVESTMENTS [2]				
Grazing	$	0 to +302	0 to +302	+302
Investments [3]	$	0 to -306	0 to -306	-306
Net Economic Value [4]	$	-4 to 0	-4 to 0	-4
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced Access [5]	$	0	-66	0
Oil and Gas Leases	$	-6,720	-2,120	0
Total	$	-6,720	-2,186	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-6,724 to -6,720	-2,190 to -2,186	-4

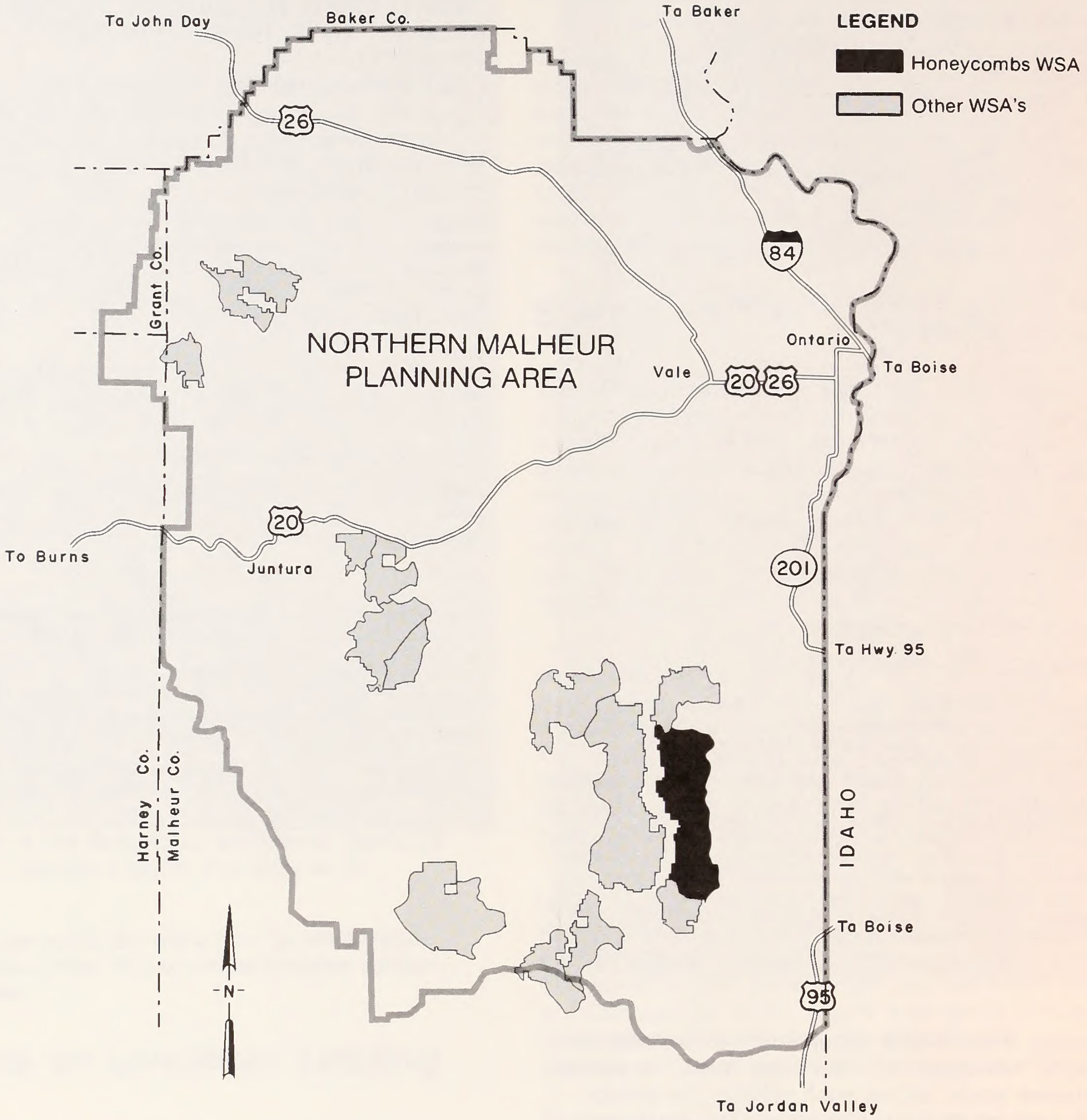
[1] Expected future increases due to range improvement investments.
[2] Expenditures for structural projects involving up to $3,800, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[4] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.
[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

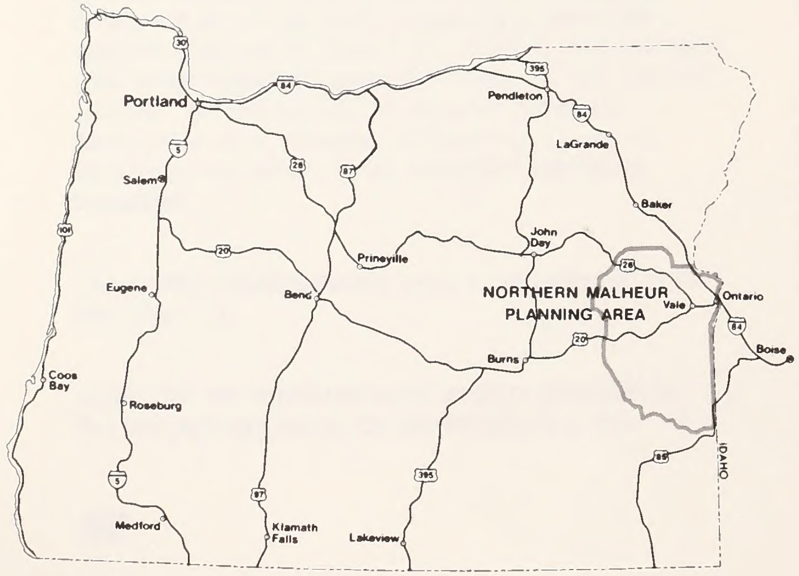
Currently, there is little dependence on vehicles for livestock management in the study area. The partial alternative would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $66 per year.

Table 7. Effects of Alternatives on Local Personal Income, Honeycombs WSA (OR-3-77A) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing: Investment [1]	AUM	0 to +40	0 to +40	+40
Oil and Gas Leases	Acres	-6,720	-2,120	0
INCOME FROM PROPOSED INVESTMENTS [2]				
Grazing	$	0 to +643	0 to +643	+643
Construction Activity [3]	$	0 to +523	0 to +523	+523
Total [4]	$	0 to +643	0 to +643	+643
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Oil and Gas Leases	$	-2,024	-638	0
INCOME FROM ALL OUTPUT CHANGES				
All categories [4]	$	-2,024 to -1,381	-638 to +5	+643

[1] Expected future increases due to range improvement investments.
[2] Expenditures for structural projects involving up to $3,800, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.
[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.





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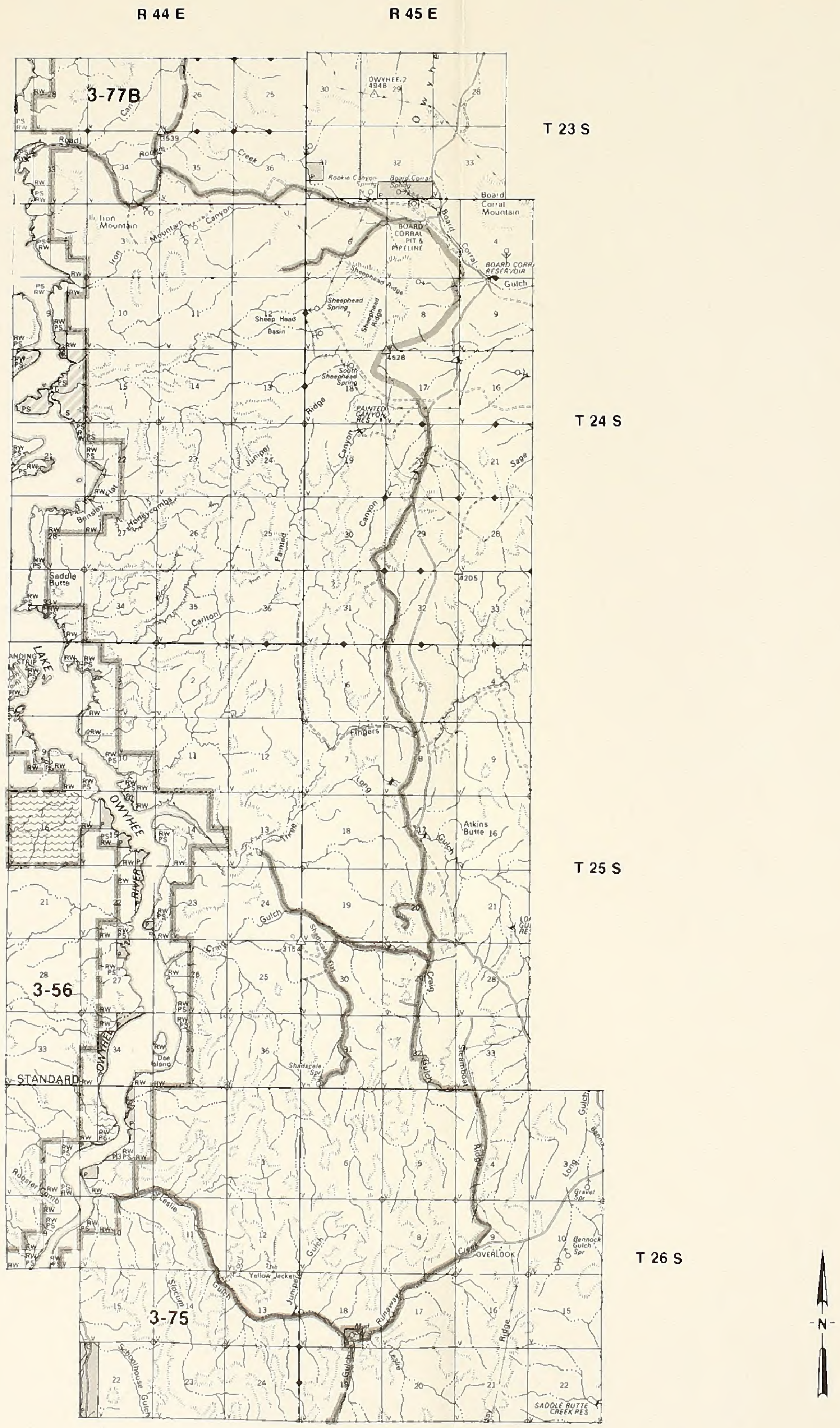
Vale District

Honeycombs WSA
OR-3-77A

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▬ Wilderness Study Area Boundary
- ╍ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▨ State
- ▩ Private
- ≋ BLM Surface-State or Private Subsurface (Split Estate)

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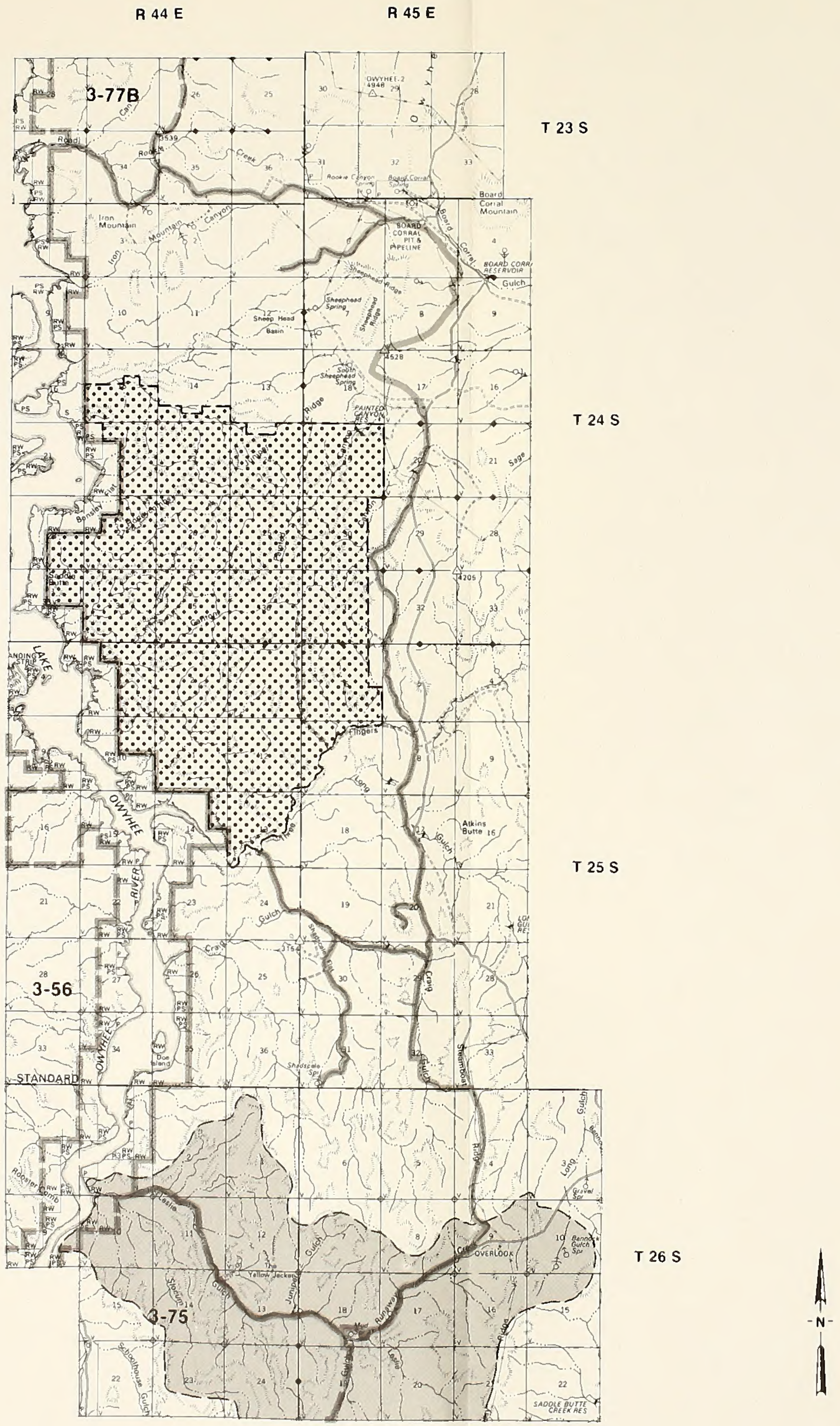
Honeycombs WSA
OR-3-77A

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

▨ Honeycombs ACEC & RNA

▭ Leslie Gulch ACEC

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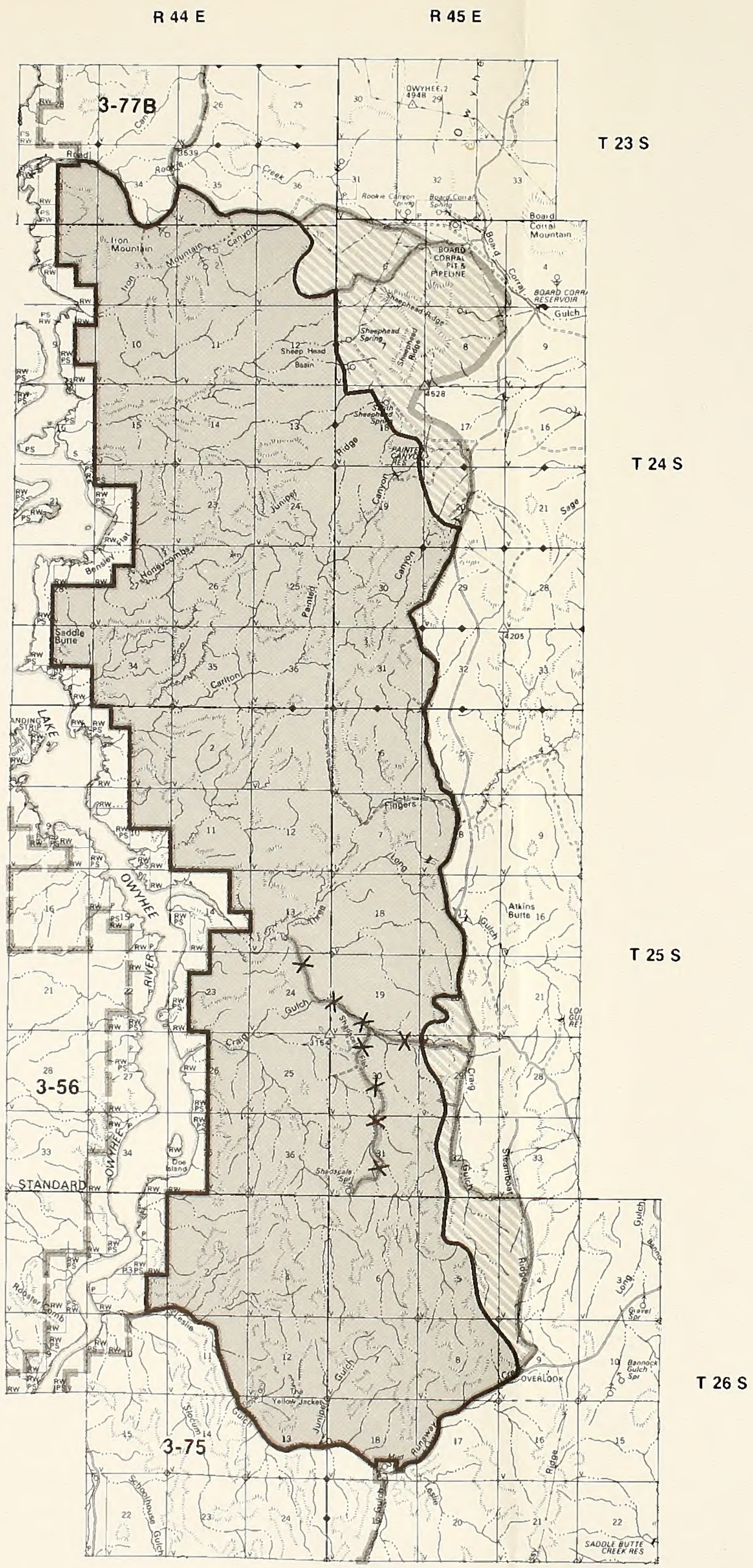
Honeycombs WSA
OR-3-77A
AREA OF CRITICAL ENVIRONMENTAL CONCERN & RESEARCH NATURAL AREA

1 0 1 2 MILES

MAP 3



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

✗—✗ Recommended Road Closure

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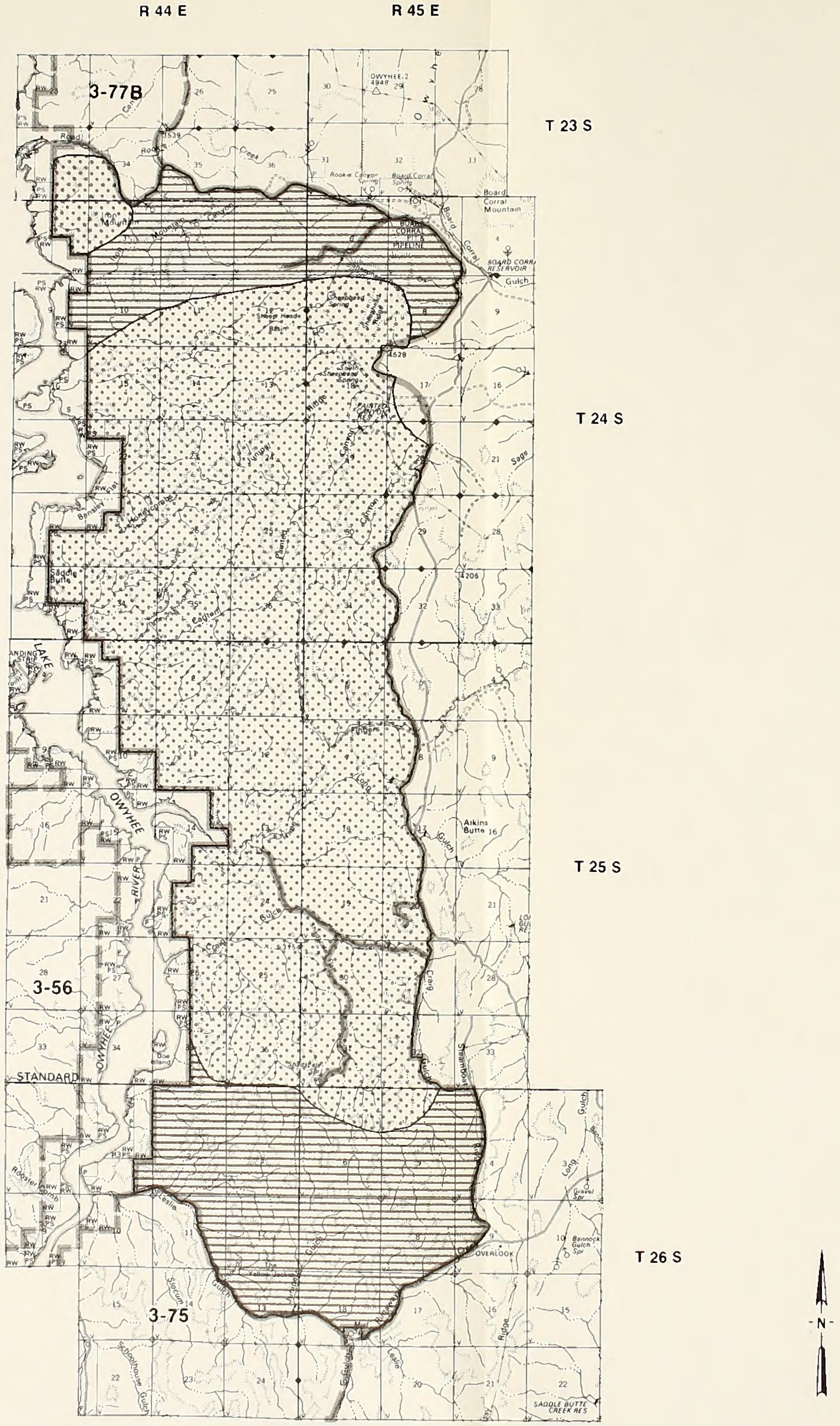
Honeycombs WSA
OR-3-77A

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 4



▤ **Medium Potential (3B) for Gold and Silver**

░ **Medium Potential (3C) for Gold and Silver**

Entire WSA:
Medium Potential
(3B) for Oil and Gas and
Bentonite
(3C) for Perlite

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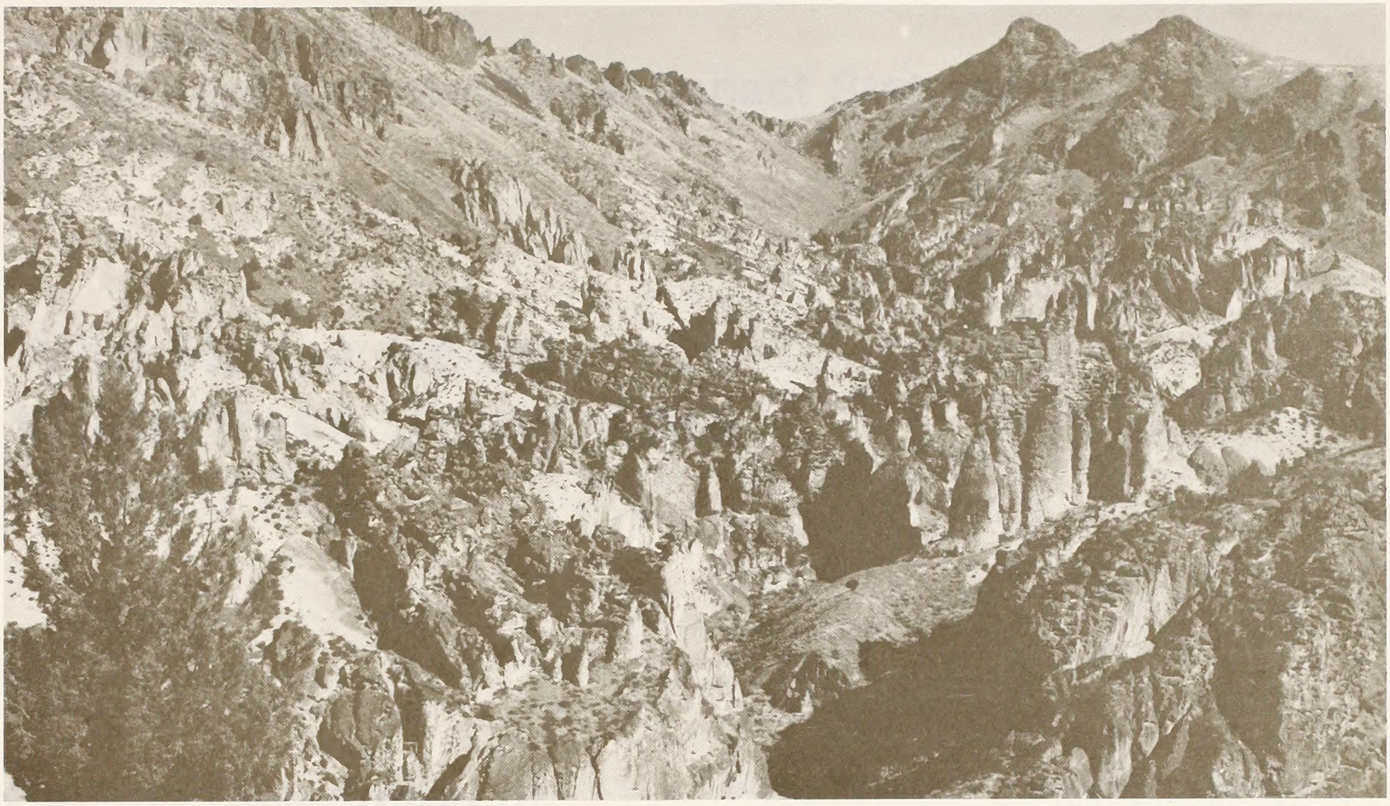
Honeycombs WSA
OR-3-77A

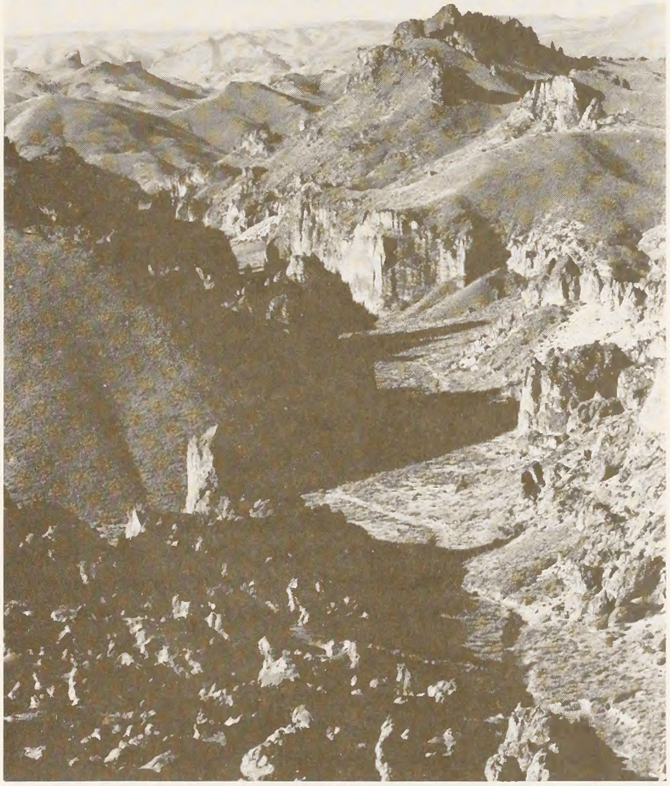
MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 5



Honeycombs WSA, OR-3-77A. Southern portion of WSA looking north up Juniper Gulch. Within area recommended suitable under the partial (preferred) alternative. September 1983.



Honeycombs WSA, OR-3-77A. Central portion of WSA looking south down Painted Canyon. Within area recommended suitable under the partial (preferred) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Wild Horse Basin Wilderness Study Area (OR-3-77B)

General Description of Study Area

The Wild Horse Basin wilderness study area (WSA) is located east of Owyhee Reservoir in Malheur County, approximately 26 miles south of Vale and 36 miles northwest of Jordan Valley (see map 1). U.S. Highway 20 is located 20 miles to the northwest and U.S. Highway 95 is 15 miles east of the area.

The area is crescent shaped, approximately 6.5 miles long, and 3 miles wide, and contains 12,100 acres of public land (see map 2). In addition, there is a 40-acre parcel of private land located in the southeastern portion of the WSA.

The boundary is formed by Bureau of Reclamation and state land on the north and west sides and by roads on the south and east sides of the area. A dead-end road enters the study area on the south, forming part of the boundary near Indian Creek, and extends 3.5 miles to a developed spring in Wild Horse Basin.

The terrain varies from steep and rugged slopes fronting the Owyhee Reservoir to rimmed plateaus, rolling hills in the eastern portion along the Owyhee Ridge and the headwaters of Birch Creek, Indian Creek, and Cherry Creek. The north and west sloping canyons and ridges contain numerous basalt outcrops and rims. Elevation ranges from about 2,600 feet along the west boundary adjacent to the Owyhee Reservoir to nearly 4,700 feet along the Owyhee Ridge near the east boundary.

Vegetation in the WSA consists mainly of sagebrush and grass communities.

Interrelationships

The Wild Horse Basin WSA is adjacent to the Honeycombs WSA (OR-3-77A) on the south. The Honeycombs WSA is adjacent to the Slocum Creek WSA (OR-3-75) and the former Upper Leslie Gulch WSA (OR-3-74). All are separated by roads.

Land administered by Bureau of Reclamation in connection with its management of the Owyhee Reservoir lies between the WSA and the reservoir, on the west and north.

Most of the WSA is in the Three Fingers wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- management of the wild horse herd in the WSA (see the Statewide EIS volume),

- outside sights and sounds affecting the WSA,

- existing mineral rights in the WSA,

- access to the private inholding (effects of wilderness designation on private lands are discussed in the Statewide EIS volume), and

- a water pipeline right-of-way in the northeast portion of the WSA. (A spring, water cistern, and pipeline on Birch Creek in the northeast corner of the WSA serve the Owyhee Reservoir resort just north of the WSA. Operators of the resort use motor vehicles to maintain the spring and associated developments. Under wilderness designation, vehicle use by the resort operators to maintain these facilities would be allowed if there were no other practical alternatives to using vehicles. Therefore, this issue is not discussed further in the appendix.)

Also raised as an issue was the possibility of combining Wild Horse Basin WSA with the adjacent Honeycombs WSA and nearby WSAs, Slocum Creek WSA (OR-3-75), the former Upper Leslie Gulch WSA (OR-3-74), the Dry Creeks Buttes WSA (OR-3-56), and the Dry Creek WSA (OR-3-53), into a single wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (preferred alternative)

An enhanced wilderness alternative that would combine this WSA with the Honeycombs WSA is not analyzed because the road separating the WSAs is essential for vehicle access to the resort cabins along the Owyhee Reservoir. Closure of this road would eliminate road access to these developments.

An enhanced wilderness alternative that would combine this WSA with the adjacent Honeycombs WSA, and the nearby WSAs mentioned above are not analyzed because the WSAs on the east side of Owyhee Reservoir are separated from each other by roads needed for public and BLM access to the area. The Dry Creek Buttes and Dry Creek WSAs are separated from the other WSAs by the Owyhee Reservoir, which is managed by the Bureau of Reclamation and is not subject to wilderness review.

Also, closing the dead-end road and recommending acquisition of the private inholding under an enhanced wilderness alternative is not analyzed because it would not be substantially different from the all wilderness alternative.

A partial alternative is not analyzed because there are no major conflicts that could be resolved by recommending only a part of the WSA as suitable for wilderness.

All Wilderness

The all wilderness alternative would recommend the entire 12,100 acres of public land in the WSA as suitable for wilderness (see map 2). For purposes of analysis, it is assumed the 40-acre parcel of private land in the southeast portion of the WSA would not be acquired, and the dead-end road to Wild Horse Basin spring and trough would remain open.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development, except, no surface occupancy on all mineral leases within sight of the Owyhee Reservoir, and

- restriction of vehicles to existing routes.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area is manageable as wilderness under the all wilderness alternative. There are no mining claims in the area. The 40-acre private inholding is used for livestock grazing and there are no indications that the use will change. Maintenance of a water pipeline to the Owyhee Resort might present minor management problems. Use of a wild horse trap in the WSA would be a minor management problem because it would be difficult to completely rehabilitate the site after each use.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of maintaining options for exploration and development of potential mineral resources would outweigh the benefits of preserving the area's wilderness values. The area has a high potential for geothermal resources. Outside sights and sounds reduce the naturalness of the eastern portion of the area. The area offers diverse opportunities for primitive recreation, but none is individually outstanding.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Table 1. Summary of Proposed Management Under Each Alternative, Wild Horse Basin WSA (OR-3-77B)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	12,100	0
Acres Closed to ORVs by Wilderness Designation	12,100	0
Miles of Ways Closed	2	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	12,100	0

Wilderness Values

Naturalness

The Wild Horse Basin WSA appears generally natural. The eastern one-third adjacent to Owyhee Ridge and Birch Creek, where the terrain is level or gently rolling, is most influenced by man-made features. Such features influence approximately 13 percent of the study area. (The area of influence is an estimate based on the acreage within the WSA from which these features can be seen.)

There are 18 interior man-made features influencing the study area: 3 reservoirs, 4 spring developments, 1 wildlife guzzler, 6 ways (vehicle routes established and maintained solely by the passage of vehicles) totaling 2 miles, 3 fences totaling 2 miles, and a wild horse trap site.

Outside sights and sounds consist of the boundary roads, livestock management developments, and the resort and recreation facilities along Owyhee Reservoir. They are concentrated to the east and northeast of the WSA and moderately diminish the naturalness in this portion of the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The opportunities for solitude and primitive and unconfined recreation in the WSA are outstanding.

The broken topography provides screening on approximately 75 percent of the area. Opportunities for visitors to find solitude are excellent; however travel corridors are generally confined to the drainage bottoms. Sights and sounds from inside and outside the WSA due to livestock management and recreation activities are intermittent and of short duration, and, therefore, have minimal adverse effect on solitude.

No one primitive recreation activity is outstanding, but collectively the opportunities are outstanding. Hikers would be attracted to the scenery and the challenging terrain in 12 drainages in the WSA. However, the small size and steep terrain would limit hiking to the natural travel corridors within these drainages.

Table 2. Summary of Environmental Consequences of Alternatives, Wild Horse Basin WSA (OR-3-77B)

Resource or Activity	All Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 12,100 acres to NWPS and preserve wilderness values, including scenic rock formations. Revegetation of 2 miles of ways would increase naturalness. Mineral development on inholding could adversely affect wilderness values. Use of trap site to capture wild horses would have slight adverse affects on wilderness values. The area would be manageable as wilderness.	Mineral development could adversely affect wilderness values. Use of trap site to capture wild horses would adversely affect naturalness more so than under the all wilderness alternative.
Energy and Mineral Development	Development precluded on 12,100 acres, including 12,100 acres with high potential for geothermal and optical calcite and moderate potential for oil and gas and perlite.	No impact.
Economic Value and Local Income	Decrease in economic value and local personal income by $440 and $133, respectively, from the loss of the oil and gas lease.	No impact.

The opportunities for hunting deer, antelope, chukar, and quail are good, despite the steep terrain which limits mobility and shooting opportunities. Some of the big game hunting is done by horseback.

Opportunities for birdwatching, scenic and geological sightseeing, and photography are also good.

Special Features

Northern bald eagles, which are federally listed as threatened in Oregon, winter on the Owyhee Reservoir. (These birds are discussed further in the Wildlife section.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, the WSA is located in the Intermountain Sagebrush Province and the potential natural vegetation of this WSA is the sagebrush steppe. Of the vegetative communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, the WSA contains the big sage/bluebunch wheatgrass community.

Boise, Idaho is the only standard metropolitan statistical area with population over 100,000 within 5 hours' driving time of the WSA.

Energy and Mineral Development

The primary source for evaluation of the energy and mineral potential of the Wild Horse Basin WSA is a report by TERRADATA, a consulting firm under contract with BLM. The report by TERRADATA consists of an assessment of the Geology, Energy and Mineral (GEM) resources of the WSA. This information was reevaluated by BLM geologists.

The WSA has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Optical calcite has high favorability for occurrence in the WSA and is exposed along the southern border. Geothermal resources are also rated with high favorability. Oil and gas and perlite have moderate favorability for occurrence.

Table 3 shows the mineral potential classifications for the WSA.

As of January 1, 1984, there was one oil and gas lease covering 440 acres, and no geothermal leases or mining claims in the WSA.

Most of the WSA contains olivine-poor basalt and andesite basalt. Periodic flows have created a layering effect. The southeast corner contains volcaniclastic and clastic rock of fluvial (stream) and

Table 3. Classification of Energy and Mineral Potential, Wild Horse Basin WSA (OR-3-77B)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, silver, mercury)	Entire WSA	2	C
Geothermal	Entire WSA	4	C
Uranium/Thorium	Entire WSA	1	B
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	B
Diatomite	Entire WSA	1	B
Zeolites	Entire WSA	1	B
Optical Calcite	Entire WSA	4	C
Perlite	Entire WSA	3	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

lacustrine (lake) origin. Basalt intrudes these rocks in the form of necks, minor flows and sills. All exposed rocks are Tertiary. Paleozoic and Mesozoic rocks may occur at lower unknown depths as this WSA is within western Triassic and western late Paleozoic depositional basins.

Vegetation

The area lies within the sagebrush steppe ecological zone and the predominant climax vegetation is a Wyoming big sagebrush/bluebunch wheatgrass association. Cheatgrass is the most abundant grass species. Some riparian vegetation can be found in the lower reaches of Birch Creek and Indian Creek.

Wildlife

Wildlife is moderately abundant due to developed water sources within and adjacent to the WSA.

Mule deer occur throughout the area yearlong. Antelope range during the summer in the southeast portion of the study area. California bighorn sheep occur to the south of the WSA in the Honeycombs area. It is suspected that sheep occasionally use the area even though it is outside their primary range. Chukar, California quail and mourning doves are common in the WSA.

Northern bald eagles pass through the area in their annual spring and fall migrations. Some birds winter on the Owyhee Reservoir as long as open water persists. A total of 20 to 30 eagles were counted in the reservoir area during the nationwide eagle count conducted in January 1983.

Livestock Grazing

The WSA is located entirely within the Mahogany grazing allotment. Table 4 shows existing livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Existing livestock projects in the WSA (among the man-made features mentioned in the Naturalness section) include 3 reservoirs, 4 spring developments, and 2 miles of fence.

No livestock projects are proposed in the WSA.

Motor vehicles are presently used by livestock operators in the WSA to place salt, check livestock and maintain reservoirs and springs.

Recreation Use

Mule deer, antelope, chukar, and quail are currently hunted in this WSA. Hunting is limited because of the rugged terrain which restricts shooting opportunities. Most of the hunting is done on horseback. No fishing opportunities exist. The excellent fishing and boating on the nearby Owyhee Reservoir bring people into the area who take advantage of the WSA's primitive recreation opportunities.

ORV use is restricted by the rugged terrain, and by the restriction of vehicular use to existing roads and ways.

Table 4. Existing Livestock Use, Wild Horse Basin WSA (OR-3-77B)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)
Mahogany (No. 0500)	30,183	6/1-5/30	5	1,513

Economic Value and Local Income

Livestock grazing, oil and gas leasing, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there was 1 oil and gas lease and no geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 12,100 acres to the National Wilderness Preservation System (NWPS) and would preserve the area's wilderness values, including the special features, naturalness and opportunities for solitude and primitive recreation. Closure of 2 miles of ways would allow them to revegetate, and the immediate vicinity of the ways would become more natural.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Wildhorse Basin WSA (OR-3-77B) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	1,513	$11,408	$24,329
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	440	440	133
Total			$11,848	$24,462

If minerals were developed on the 40-acre private inholding, wilderness values on the surrounding public land would be adversely affected.

Under all the alternatives, BLM would continue to use a wild horse trap in the WSA, which is needed to gather horses from the Three Fingers herd (on a proposed four year gathering cycle). There are no feasible sites within the wild horse herd area to relocate the trap. Periodic rehabilitation of the trap site and access road after each gathering operation would be difficult (surface disturbances in this desert environment require long periods of time to heal). Wild horses in this area are estimated to increase their herd size about 20 percent per year. Without checking this population increase through periodic gatherings, range (vegetative) condition within the herd area would rapidly deteriorate.

Under the all wilderness alternative, the wild horse trap would be removed after each gathering and, because the trap is located on a boundary road, the overall effect on the area's naturalness would be minimal. Since the gathering would only occur on the average of once every four years, the effects on opportunities for solitude also would be slight.

Under the **no wilderness/no action alternative**, horse gathering activities at the horse trap would detract from the naturalness of the immediate vicinity of the trap more than under the all wilderness alternative because panels would not be removed and the site would not be rehabilitated after each gathering. Mineral development could adversely affect wilderness values in any part of the area.

Effects on Energy and Mineral Development

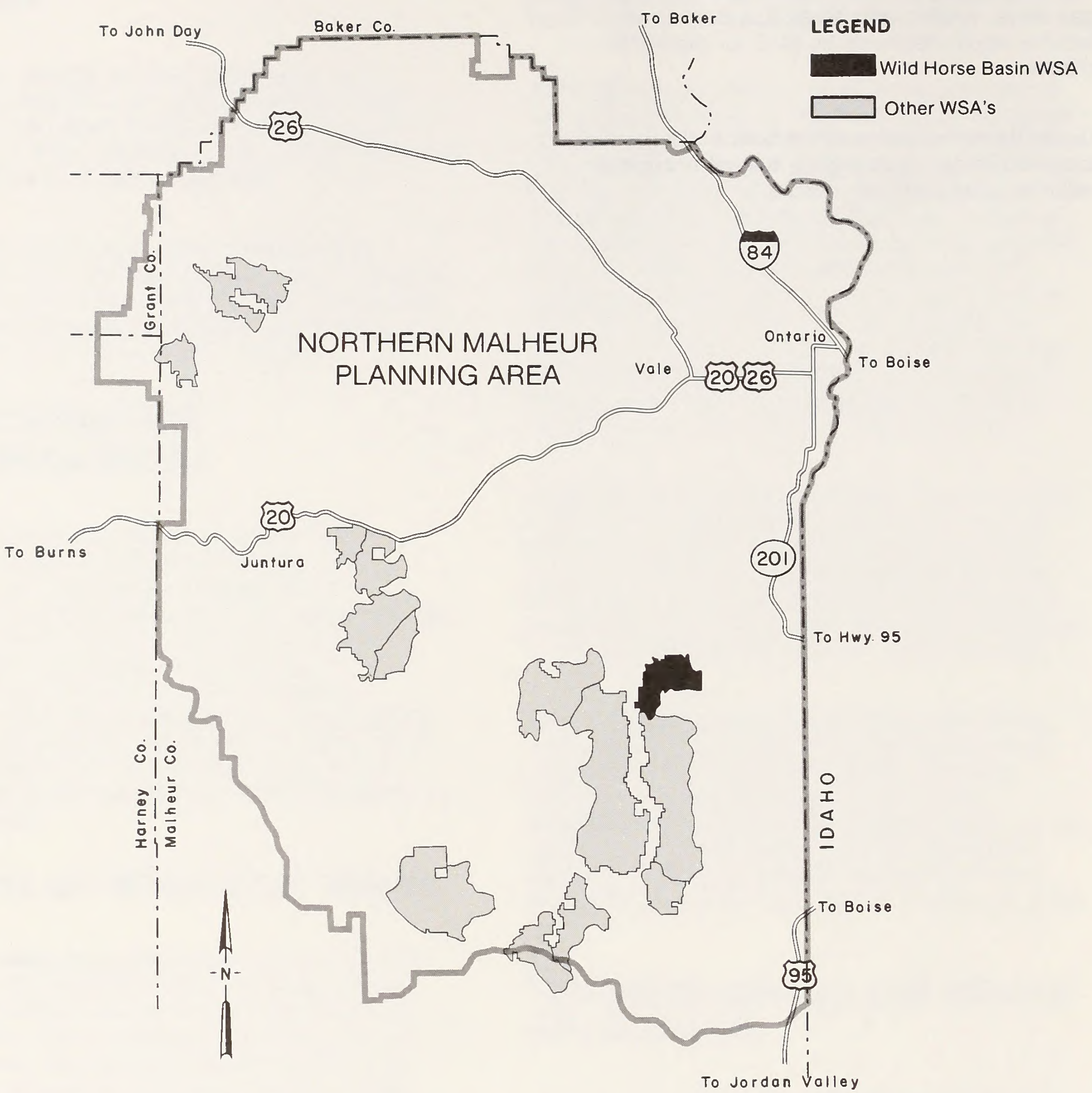
Under the **all wilderness alternative**, 12,100 acres would be withdrawn from mineral exploration and development. This would include the areas rated moderate for oil and gas and perlite, and the areas rated high for geothermal resources and optical calcite, which encompass the entire WSA.

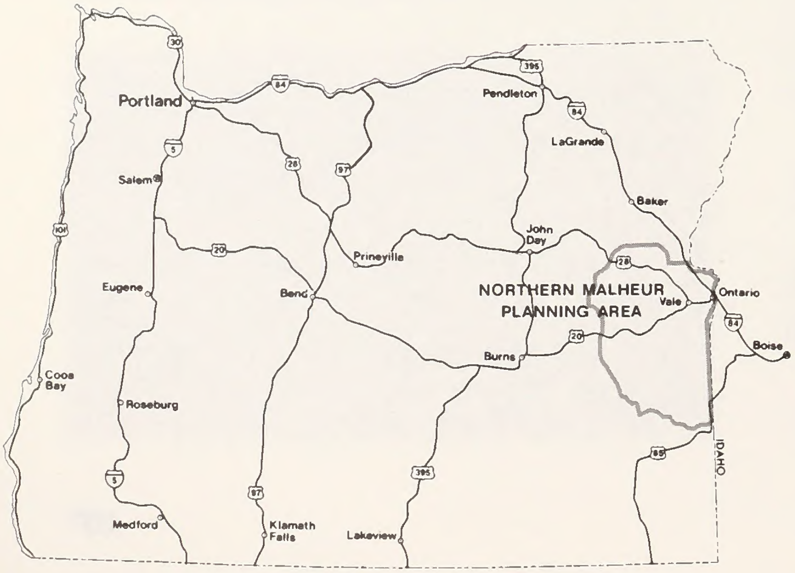
No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Economic Value and Local Income

Under the **all wilderness alternative**, annual economic value of resource outputs in the WSA would decrease by $440 due to loss of the oil and gas lease, totaling 440 acres. Local personal income would decrease by $133 for the same reason.

Under the **no wilderness/no action alternative**, there would be no change in annual economic value or local personal income.





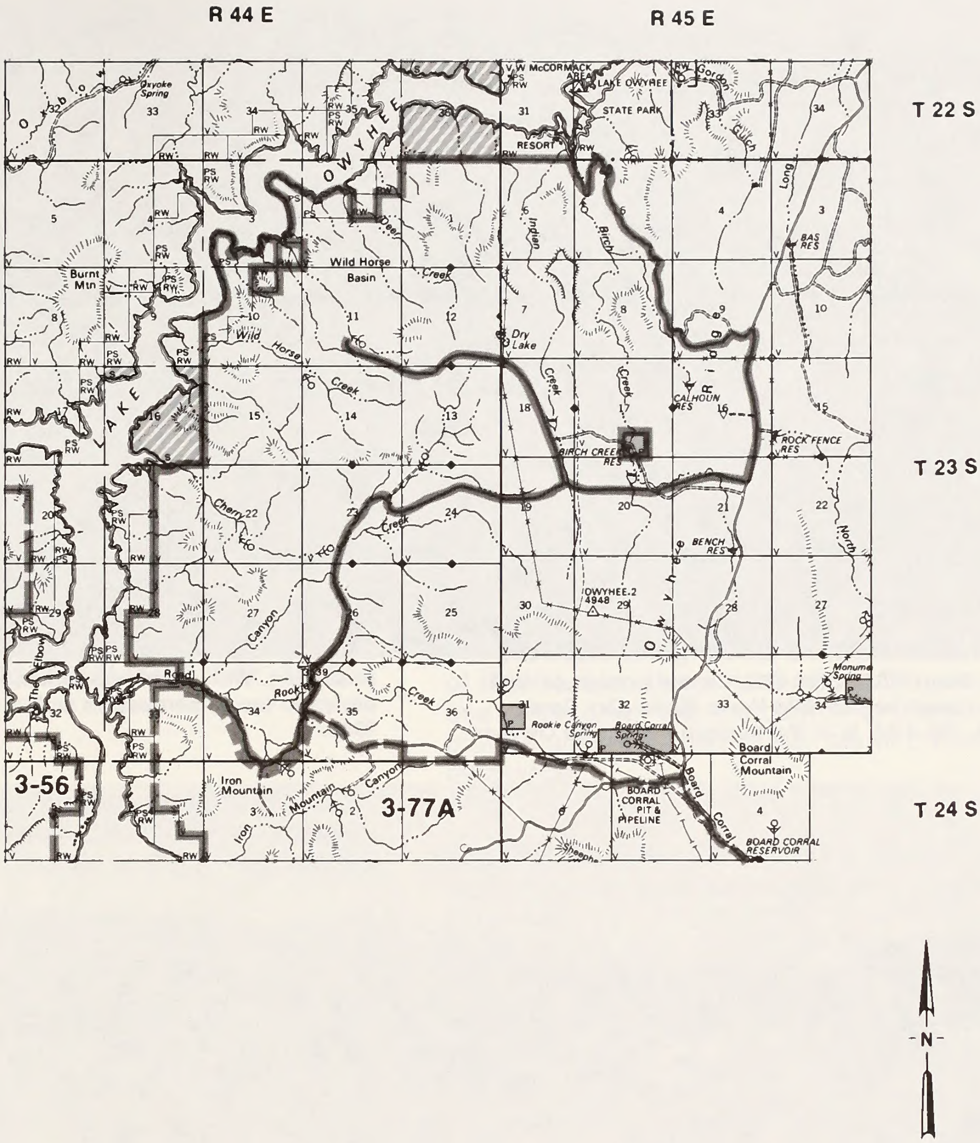
U.S. Department of the Interior
Bureau of Land Management
Vale District

Wild Horse Basin WSA
OR-3-77B

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ State

▩ Private

U.S. Department of the Interior
Bureau of Land Management
Vale District

Wild Horse Basin WSA
OR-3-77B

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2

Wild Horse Basin WSA, OR-3-77B. Central portion of WSA looking southwest across Wild Horse Basin (Dry Creek Buttes WSA, OR-3-56, is in the background across Owyhee Reservoir). Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Wild Horse Basin WSA, OR-3-77B. Northwestern portion of WSA looking north across plateau above Indian Creek. Within area recommended nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Lower Owyhee Canyon Wilderness Study Areas (OR-3-110)

General Description of the Study Area

The Lower Owyhee Canyon wilderness study area (WSA) is located in Malheur County, approximately four miles northwest of Rome, and U.S. Highway 95 (see map 1).

The WSA contains 71,940 acres of public land (see map 2). Also within the WSA are 1,180 acres of private land and 1,160 acres of split estate (federally managed surface, state or privately owned subsurface mineral rights). In addition, 320 acres of private land and 320 acres of split estate are located at the ends of dead-end roads. These parcels are not inside the WSA because the WSA boundary extends along the dead-end roads, but the parcels are surrounded by BLM lands.

The boundaries of the WSA are formed by roads, private property, split estate and a crested wheatgrass seeding. The study area is approximately 24 miles long (from north to south); it is 9 miles wide at its widest point and 1 1/2 miles at the narrowest (from east to west). Six dead-end roads totaling 7 miles enter the study area, forming part of the boundary. One enters Chalk Basin and another provides access to Sand Springs, both along the west-central boundary; another extends west from The Hole In the Ground Ranch in the northwest corner of the WSA, and three protrude into the WSA along the east-central boundary. Two of these are on the plateau above the canyon and one drops down into the canyon at Bogus Creek to provide access to several parcels of private inholdings.

The Owyhee River Canyon is the central feature of this WSA. Along its 32-mile course through the study area, the canyon varies in width from 1/4 to several miles, and varies in depth from 800 to 1,000 feet. The sheer canyon walls fade away near Ryegrass Creek, The-Hole-in-the-Ground, and Mud Creek. The topography of the tributaries also varies from canyon-like to gently rolling slopes. Bogus Creek is spring fed and provides the only perennial water other than the Owyhee River. The ephemeral streams are relatively short, ranging in length from 3/4 to 4 3/4 miles.

Lambert Rocks and Chalk Basin, which straddle the canyon near Ryegrass Creek, are highly scenic; they appear white which sets them apart from the surrounding country. There is a diversion dam on the river near the north boundary of the WSA at The-Hole-in-the-Ground.

Above the canyon rim, the plateau gently slopes upward toward the boundary of the WSA. The plateau contains several playas holding late winter and early spring water that supply water table recharge and overland flow. Elevations range from 4,639 feet near the north boundary to 2,860 feet in the canyon bottoms at the south border.

The plateaus are easily accessible on foot. The slopes of the canyons are impassible except in the drainages that cut through the rimrock. The canyon slopes are clustered with large boulders. The rimrock varies in height from tens of feet to hundreds of feet.

Interrelationships

Adjacent to the Lower Owyhee Canyon WSA is Saddle Butte WSA (OR-3-111) on the west, Cedar Mountain WSA (3-47) on the north, and Owyhee Breaks WSA (3-59) on the east. All the adjoining WSAs are separated by roads.

The river corridor in the WSA is included in the Owyhee River Area of Critical Environmental Concern (ACEC) (see map 3). Special management of the ACEC includes the following:

- maintaining the current ORV closure on 700 acres and limiting ORV use in the balance of the ACEC to designated roads and trails;

- erecting barriers and signs to deter ORV use and protect the fragile habitat;

- continuing river patrols during high use to monitor and to prevent over use which may damage the sensitive values; and

- conducting studies of river carrying capacity and then regulating river use to prevent damage to sensitive plants, fish and wildlife habitat.

The portion of the Owyhee River flowing through the WSA is part of a 50-mile segment of the river that has been designated a wild river component of the National Wild and Scenic Rivers System. The federal designation withdraws from mineral location and leasing all public lands within 1/4 mile on each side of the river (9,360 acres within the WSA). Most of this stretch of river (all of it within the WSA) is also an Oregon State Scenic Waterway. The state designation provides some state control over private land use changes within 1/4 mile of the stream, which affects the private lands inside the WSA.

These restrictions within the ACEC and under the wild river designation would continue to apply within the WSA whether or not the area is designated wilderness.

Part of the land along the Owyhee River is administered by the Bureau of Reclamation in connection with their management of Owyhee Reservoir.

Also, a portion of the land along the Owyhee River is part of a power site reserve, which earmarks the land for potential water power and water storage development. The "withdrawal" will be reviewed because of the wild river designation, which may lead to its revocation. Power site development is not foreseen, and therefore not discussed further.

A portion of the WSA is in the Sand Springs wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- management of the wild horse herd (see Statewide EIS volume),

- potential development of minerals,

- the presence of split-estate and private inholdings,

- the presence of seven miles of dead-end roads entering the WSA,

- possible development of a potential north-south utility corridor, and

- proposed construction of livestock developments.

Also raised as an issue was the effect of the WSA's poor configuration, in the extreme northern portion, on the area's suitability as wilderness.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- partial (preferred alternative)
- no wilderness/no action

An alternative which would combine this WSA with adjacent WSAs by closing the roads between them is not analyzed because the roads are needed to provide access for management of lands in the area.

All Wilderness

Under the all wilderness alternative, all 71,940 acres of public land within the WSA would be recommended suitable as wilderness (see map 2). For purposes of analysis, it is assumed the private land and split-estate inholdings would not be acquired and the six dead-end roads would remain open to vehicle use.

Enhanced Wilderness

Under the enhanced wilderness alternative, all 71,940 acres of public land would be recommended suitable as wilderness (see map 4). In addition, an attempt would be made to acquire 3,360 acres of split estate and 1,500 acres of private inholdings. (Three parcels of split estate containing 1,480 acres are located inside the WSA, and 6 parcels containing 1,880 acres are adjacent to the WSA.) These land could be acquired through purchase or exchange with willing owners.

Assuming acquisition of these lands, the total area recommended suitable under this alternative would be 76,800 acres.

The six dead-end roads would be closed, subject to continued access by the owner to private property if the private property were not acquired, or to mining claims if the claims are determined to be valid.

Partial (Preferred Alternative)

Under the partial alternative, 46,660 acres of public land would be recommended suitable as wilderness and 25,280 acres of public land would be recommended nonsuitable (see map 5). In addition, an attempt would be made to acquire five parcels containing 940 acres of private inholdings and five parcels containing 1,625 acres of split estate, through purchase or exchange with willing owners.

Assuming acquisition of these parcels, total area recommended suitable would be 49,225.

The area recommended as nonsuitable consists of four areas ranging in size from 1,800 acres to 13,400 acres. The recommended boundary for the partial alternative would consist of roads, private property, legal subdivisions, a way, topographic features and the edge of a grass seeding. The northwestern portion and the southern tip of the WSA that are recommended as nonsuitable are separated from the suitable portion by legal subdivisions. The west-central portion of the WSA is separated from the suitable portion of the WSA by a way. The nonsuitable northeastern portion of the WSA is separated from the suitable portion by a way (a vehicle route established and maintained solely by the passage of vehicles) and a line 1/4 mile back from the rim of the canyon.

Three dead-end roads totaling 4 miles along the middle of the eastern boundary would be closed, subject to continued access to private property by the owner if the property were not acquired. In addition, a one-mile, dead-end road into Chalk Basin would be closed, subject to continued access by the mining claimants if mining claims at the end of the road were determined to be valid.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features, in addition to ACEC constraints, relevant to this analysis:

- continued availability for mineral exploration and development, except for the 9,360 acres withdrawn 1/4 mile back from either side of the river;
- restriction of off-road vehicle (ORV) use to existing routes outside the ACEC;

- construction of proposed livestock improvement projects, including a reservoir, 3 spring developments, and a fence; and

- possible powerline construction in a potential north-south utility corridor across the extreme west-central side of the WSA.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

Under the all wilderness, enhanced wilderness, and partial alternatives the area would be manageable as wilderness. Manageability problems could result from a concentration of private inholdings, mining claims, and potential development of split-estate lands and dead-end roads.

Table 1. Summary of Proposed Management Under Each Alternative, Lower Owyhee Canyon WSA (OR-3-110)

Proposed Management	All Wilderness	Enhanced Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	71,940	71,940	46,660	0
Acres Closed to ORVs by Wilderness Designation[1]	71,240	71,240	45,960	0
Miles of Roads Closed	0	7	5	0
Miles of Ways Closed	28	28	11	0
Acres of Full Fee Estate Acquired [2]	0	1,500	940	0
Acres of Split Estate Acquired [2]	0	3,360	1,625	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation [3]	62,580	62,580	37,620	0
Structural Livestock Projects Developed:				
Reservoirs & Waterholes (number)	0-1	0-1	0-1	1
Springs (number)	0-3	0-3	0-3	3
Fences (miles)	0-1	0-1	0-1	1
Unallocated Existing Forage Allocated (AUMs)	0-13,382	0-13,382	0-13,382	13,382

[1] A total of 700 acres are currently closed under the ACEC designation.
[2] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.
[3] Does not include acreage already congressionally withdrawn through the Wild and Scenic River designation.

Some of these problems would be resolved under the enhanced wilderness alternative by closure of the dead-end roads and acquisition of the split-estate and private land. Under the partial alternative, the area would be more manageable as wilderness because portions of the WSA with poor configuration, concentrations of private and split-estate lands, mining claims, and ways would be recommended nonsuitable for wilderness.

Rationale for the Selection of the Preferred Alternative

The partial alternative is preferred because the benefits of preserving wilderness values in the portion recommended as suitable for wilderness outweigh the benefits of maintaining options for resource development. Most of the wilderness values in the WSA would be preserved in the partial alternative.

Special wilderness features in the portion recommended suitable for wilderness include deeply incised canyons, interesting spires and rock formations, Chalk Basin, virtually undisturbed riparian zones, excellent fishery, outstanding raptor habitat, deer winter range, bighorn sheep, river otter and kit fox habitat, and crucial antelope range. Unique ecological interrelationships exist between the aquatic, riparian, and cliff habitats and between the diversity of wildlife species. This portion of the study area also offers outstanding opportunities for solitude and primitive recreation.

canyonland scenery is outstanding. Numerous archeological sites exist and there is evidence of early settlers. There are outstanding opportunities for educational and scientific study of the area's wildlife, geology, plants and cultural resources.

Acquiring the split-estate and private lands would prevent potential impairment of wilderness values from access and development. Closing the roads would eliminate these adverse effects upon the area's naturalness and opportunities for solitude and primitive recreation.

The partial alternative would eliminate from wilderness designation portions of the WSA having a concentration of private and split-estate inholdings, poor configuration, mining claims, and ways leading to livestock developments. The portions recommended as nonsuitable contain moderate potential for the discovery of gold, silver, and mercury. By not including these areas in the recommended alternative, potential wilderness manageability problems are reduced.

Table 2. Summary of Environmental Consequences of Alternatives, Lower Owyhee Canyon WSA (OR-3-110)

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 71,940 acres to the NWPS. Includes plateau and broken terrain above Owyhee River Canyon, the canyon, riparian lands, raptor habitat, and potential bighorn sheep habitat. Solitude and naturalness enhanced by closure of 28 miles of way. Mineral development on inholdings would adversely affect wilderness values. The recommended area would be manageable as wilderness.	Would add 76,800 acres to the NWPS, assuming 4,860 acres of private and split-estate land is acquired. Effects similar to all wilderness alternative, except that revegetation of 7 miles of closed roads and 28 miles of ways would enhance naturalness of the area, and acquisition of inholdings would preclude adverse effects of possible mineral development on the inholdings. The recommended area would be manageable as wilderness.	Would add 49,225 acres to NWPS, assuming 2,565 private and split-estate land is acquired. Effects similar to all wilderness alternative because most of the area's wilderness values would be preserved in wilderness. Closure of 5 miles of dead-end roads and 11 miles of ways would enhance wilderness values. Limited number of wilderness values in portion recommended nonsuitable would be adversely affected by mineral development. The area recommended suitable would be manageable as wilderness.	Naturalness, opportunities for solitude and primitive recreation and special features could be adversely affected by mineral development (except in 9,360 acres protected by wild river designation) and by construction of powerline in 4½ miles of utility corridor.
Energy and Mineral Development	In addition to 9,360 acres already withdrawn by wild river designation, development precluded on 62,580 acres, including 62,580 acres with moderate potential for metals, geothermal, oil and gas, bentonite, zeolite, and fluorite.	Same as all wilderness, except development precluded on an additional 3,980 acres if acquired.	In addition to area already withdrawn by wild river designation, development precluded on 37,620 acres plus an additional 1,685 acres if acquired. Includes 37,620 acres with moderate potential for metals, geothermal, oil and gas, bentonite, zeolite, and fluorite.	No impact.
Livestock Grazing	If projects not allowed, 193 additional AUMs would be foregone; allocation of 13,382 available but unallocated AUMs might not be allowed.	Same as all wilderness alternative except that livestock operators may not be allowed unrestricted vehicle use along the Bogus Ranch Roads for management.	Same as enhanced wilderness.	Livestock projects would result in potential forage gain of 193 AUMs. 13,382 AUMs of available but unallocated forage would be allocated.
Utility Corridor Routing	Rerouting of potential utility corridor would not add to its length.	Same as all wilderness.	Same as all wilderness.	Corridor could be located as proposed.
Recreation Use	No effect on recreation use.	Inconvenience to vehicle-oriented recreationists due to closure of Bogus and Chalk Basin roads. Net effect on total recreation use would be small.	Same as enhanced wilderness.	No change to overall recreation use.
Economic Value and Local Income	Increase in economic value and local personal income by $101,340 and $218,286, respectively, if proposed structural projects were allowed and if the full adjustment to use currently but unallocated forage were allowed. There would be no change from the present situation if the projects were not allowed and if the full adjustment were not allowed.	Increase in economic value and local personal income by $101,190 and $218,286, respectively, if structural projects were allowed and if the full adjustment to use currently available but unallocated forage were allowed. There would be a decrease of $150 in economic value and no change in local personal income if projects were not allowed and if the full adjustment were not allowed. The maximum increase in transportation costs to livestock operators from closure of roads would be $150.	Same as enhanced wilderness.	Increase in economic value and local personal income by $101,340 and $218,286, respectively, from construction of all proposed projects, and from adjustments to use currently available but unallocated livestock forage.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Lower Owyhee Canyon WSA appears to be in an essentially natural condition. The rugged terrain has limited the number of man-made features. Most of these features are associated with ranching operations. Some 33 man-made features influence about 4 percent of the WSA. (The area of influence is an estimate of the acreage in the WSA from which the features can be seen.) These features include 7 fences totaling 6 miles, 9 reservoirs, a water trough, a fenced exclosure, a cow camp, an old diversion dam, an abandoned canal ditch, and 12 ways totaling 28 miles.

Outside sights and sounds affecting naturalness in the WSA include a seeding, fences, water towers, reservoirs, corrals, ranch buildings and mines. The outside sights and sounds are both near and distant, but do not diminish the WSA's naturalness to a substantial degree.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The large size and abundant topographic screening of the WSA provides outstanding opportunities for solitude. The main canyon and numerous tributary drainages allow visitor movement to go relatively unnoticed.

Topographic screening is outstanding in the canyonlands because of the deeply incised canyons. Screening is limited on the sagebrush plateau because of the low vegetation, shallow depressions and low rolling hills and ridges.

The main canyon has the potential to concentrate visitors into one major corridor of use (the river) and decrease opportunities for solitude there. This is offset however by the length and meandering character of the canyon and the presence of several tributaries which tend to disperse hikers and boaters. Furthermore, long stretches of river provide time and distance for visitors to adjust their travel rates and campsite locations to increase solitude while floating or hiking the river.

The area offers outstanding opportunities for primitive types of recreation, including whitewater boating, day hiking, camping, watersports, fishing, sightseeing, hunting, photography and birdwatching.

Whitewater boating on the Owyhee River is considered to be the best in eastern Oregon and ranks with the best in the northwest United States. Floatboating on the portion of the Owyhee River within the WSA is possible during spring.

The steep rugged topography of the Owyhee Canyon and its short tributaries restricts most foot travel to the canyon bottoms. Hiking the main canyon is possible for short distances but longer treks are blocked by many deep pools and sheer-walled cliffs.

Attractive campsites are numerous and fairly well-spaced along the river but few can be found elsewhere in the WSA.

The Owyhee River provides good opportunities for fishing, mainly for catfish and bass.

Sightseeing is outstanding because of the variety of geologic features in the canyon. Sightseeing and photographic opportunities abound for the enthusiast willing to undergo the considerable difficulties getting to and traveling through the remote, isolated canyon of the WSA. Subjects include abundant and varied wildlife, spectacular rock formations, and dramatic whitewater.

Bird watching opportunities are excellent. Over 150 passerine species (song birds) have been identified here, in addition to waterfowl, shore birds, raptors and upland game birds. Mule deer, geese, ducks, chukar and valley quail provide good to excellent hunting opportunities in many parts of the WSA, especially along the river. Poor access is the biggest deterrent to hunting.

Special Features

The Lower Owyhee Canyon WSA is characterized by contrasting topography between the Owyhee River, associated canyons and breaks, and the sagebrush plateaus overlooking the canyons. Complex geologic formations have been uncovered by erosion, leaving numerous layers of strata exposed and readily observable for scientific study.

Riparian vegetation can be found in narrow bands and isolated pockets next to the river. Hackberry, an unusual tree species for the desert ecosystem, occurs in clumps in the riparian zone.

The Owyhee River Canyon contrasts with the surrounding arid environment and offers outstanding opportunities to study aquatic and riparian habitats in desert surroundings.

The canyon and breaks provide habitat for several species of raptors and other birds and numerous small animals (including disjunct populations of the canyon mouse and certain species of bats). Bighorn sheep have been reintroduced in the area.

Archeological information, gathered during recent field investigations along the river, indicate a high concentration of archeological sites.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and its potential natural vegetation is sagebrush steppe and saltbush-greasewood. Of the plant communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, the Lower Owyhee Canyon WSA contains two broad plant associations: big sagebrush/bluebunch wheatgrass, and alkaline vegetation mosaic with representative communities, including greasewood, shadscale, saltgrass and spiny hopsage.

Boise, Idaho is the only standard metropolitan statistical area with population over 100,000 within 5 hours' driving time of the WSA.

Energy and Mineral Development

The energy and mineral resources of the Lower Owyhee Canyon WSA were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment and rock chip sampling by the Oregon Department of Geology and Mineral Industries (DOGAMI) under BLM contract. This geochemical survey became the primary basis for the metallic minerals classification of this evaluation. The DOGAMI report is entitled "Geology and Mineral Resources of 18 BLM Wilderness Study Areas, Harney and Malheur Counties, Oregon". Using the DOGAMI report and a heavy mineral analysis conducted by Barringer Resources, Inc., the study area was reevaluated by BLM personnel.

The area has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is rated moderately favorable for oil and gas, geothermal, bentonite, zeolites, and fluorite. The entire WSA is also moderately favorable for gold, silver, and mercury. However, in portions of the WSA, the metallic minerals classification has a higher confidence level (3C) than in the remainder of the WSA (3A). Mercury and silver are strategic and critical minerals with moderate favorability for occurrence in the WSA; however, no strategic and critical mineral deposits are known to exist in the WSA.

The mineral potential classifications, including the various confidence levels for metals, are shown in table 3. Map 6 shows the portions of the WSA rated moderate (medium) for gold, silver and mercury with a confidence level of C.

Table 3. Classification of Energy and Mineral Potential, Lower Owyhee Canyon WSA (OR-3-110)

Commodity	Area	Classification Level	Confidence Level
Metals			
Gold, silver, mercury	See map 6	3	C
Tin, molybdenum	Entire WSA	2	B
	Rest of WSA	3	A
Geothermal	Entire WSA	3	B
Uranium/Thorium	Entire WSA	1	B
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	2	A
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	3	B
Zeolites	Entire WSA	3	B
Fluorite	Entire WSA	3	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Oil and gas and geothermal are the two main potential energy resources in the area. Because of youthful volcanism and above normal heat flow, most of southeastern Oregon is generally considered favorable for thermal waters for direct-use heat application. Smaller areas within this region are favorable for high-temperature geothermal resources. None have been identified within the WSA. Oil and gas potential will largely depend on the presence or absence of suitable marine rocks at depth. There has been no deep drilling in the vicinity that has penetrated the Tertiary volcanic cover.

As of January 1, 1984, there were no geothermal or oil and gas leases in the WSA. In 1983, there were 10 oil and gas lease applications (in the central portion of the northern half of the WSA). There were no mining claims in the WSA as of January 1, 1984. The Chalk Basin claim, associated with decorative rock, lies just outside of the WSA.

Very little geologic study of a detailed nature has been done within the area. It is basically a broad north-plunging basin filled with upper Miocene to recent lacustrine (lake) and fluvially (river) deposited sediments with interbedded and mesa-capping lava flows. In this part of the basin, known as Rome Basin, the rocks are somewhat younger, and the 'Rome Beds' of middle Pliocene age are prominent. Only a few northwest and north-trending normal faults of minor significance are present.

Vegetation

Most of the WSA is dominated by big sagebrush in a typical sagebrush-grass association. Riparian vegetation occurs along the Owyhee River but is limited by steep canyon walls and high water flows which flush out vegetation and debris. Riparian species include cettis, prunes, willows, hackberry and reed canary grass.

Most of the study area is a Wyoming big sagebrush/bluebunch wheatgrass vegetative community, and the remainder is a shadscale/Indian ricegrass community. Much of the vegetation is in early-seral and mid-seral stage, with the remainder in a late-seral stage. (Seral refers to the stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.)

Wildlife

The rock cliffs afford excellent nesting habitat for many raptors. Twenty to 30 northern bald eagles (federally listed as threatened in Oregon) utilize the Owyhee Reservoir and River. Waterfowl winter in large numbers along this portion of the river. Nearly 1,000 Canada geese were counted wintering here in early January 1983. Animals other than raptors which nest or den in the cliffs during the summer include bats, swallows, swifts and rock doves.

Other wildlife common within the Lower Owyhee Canyon include chukar, mule deer, river otter, beaver, raccoon, snakes and lizards.

California bighorn sheep have been reintroduced in the vicinity of Iron Point.

Six species of game fish are found in the river within the study area: channel catfish, black bullhead, yellow perch, whitefish and small mouth bass. Catfish are the most plentiful, while bass are gradually increasing. Rainbow trout have been planted in the river but have not survived because of scarce spawning gravel, warm water and competition from nongame species. The warm water supports large populations of nongame fish including carp, squawfish and suckers.

Livestock Grazing

Portions of several grazing allotments are within the WSA. Table 4 summarizes existing and potential livestock use in AUMs (animal unit month, the amount of forage needed to sustain one cow and calf, or equivalent animals, for one month). A total of 2,669 AUMs of currently available but unallocated forage has been identified in the WSA.

Existing livestock developments (among the man-made features listed in the Naturalness section) include 9 reservoirs, 1 water tower, 1 cow camp and corral, 1 livestock exclosure, and 6 miles of fence.

Proposed livestock projects, which would better distribute livestock and make available additional AUMs in the WSA, include: three spring developments, which would allow an estimated increase of 83 AUMs; one reservoir allowing an increase of 50 AUMs; and one mile of fence allowing an estimated increase of 60 AUMs.

Licensed livestock grazing in pastures wholly or

Table 4. Existing and Potential Livestock Use, Lower Owyhee Canyon WSA (OR-3-110)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA From Projects (AUMs) [1]	Available but Unallocated Forage in Pastures (AUMs)
Crowley (No. 0303)	6,964	04/01-07/15	12	1,000	0	0
Quartz Mtn. (No. 0406)	5,026	11/01-04/15	10	3,900	0	0
Barren Valley Common (No. 0801)	10,237	11/01-03/31	10	1,490	83	9,986
West Cow Creek (No. 0902)	11,731	04/01-10/15	7	864	60	3,396
Bogus Creek (No. 0904)	250	02/15-03/31	80	200	50	0
Morcum (No. 0907)	100	11/01-02/28	80	100	0	0
Total	34,308			7,554	193	13,382

[1] Increases might or might not result in increased licensed use in the allotment (see narrative).

partially in the WSA are proposed to be increased by 13,382 AUMs by allocating available forage. Increases in the WSA would vary according to the amount of pasture in the WSA and other factors such as terrain and vegetation.

There is little or no motor vehicle use by livestock operators in the study area. Only the dead-end roads leading northwest and southwest from the Bogus Ranch are used to any extent; livestock in the rest of the WSA is adequately managed on horseback.

Utility Corridor Routing

The Bonneville Power Administration (BPA) has under long-term consideration construction of a 500-kV power transmission line through a potential north-south corridor which would pass through the west-central portion of this WSA. Most of the potential corridor is located outside the WSA with the exception of 4 1/2 miles just inside the extreme west-central boundary.

Cultural Resources

A 1976 inventory in the Owyhee River Canyon from Crooked Creek to the upper end of the Owyhee Reservoir, plus other earlier work indicates that the Owyhee Canyon and the adjacent upland areas have been utilized by man for the past 12,000 years. The inventory and earlier work identified 102 prehistoric and historic sites. Dirty Shame Rockshelter on Antelope Creek was excavated by the University of Oregon in 1973. That excavation provided a 9,000-year record of previously unknown cultural adaptation.

Some cultural resource sites in the WSA have been vandalized. Much of the vandalism has been done by people who have driven into the area on ways on the plateau above the canyon.

Recreation Use

Outstanding recreation in the canyon includes floatboating, hiking, photography, nature study, fishing, hunting, and camping. All of these activities occur in conjunction with floatboating except for camping at the end of Bogus Road. Floatboating occurs during the spring and early summer in average runoff years. In years with above average runoff, the season may extend into mid-summer. Floatboaters using very small crafts may be able to extend the season. Most visitors float the river in inflatable rafts. Kayaks are the second most popular craft and a few driftboats usually float each year. The usual put-in for this river section is the BLM launch site in Rome. There are several take-out points, all outside the WSA.

Most fishing occurs during the summer and fall for channel catfish, rainbow trout and small-mouth bass. Some fishing occurs from rafts and drift boats all along the river during the float season, but the turbid flood water severely limits opportunities.

Vehicle-oriented recreation in the WSA is limited to the few areas with roads and ways. The most popular area is along the river at the end of Bogus Road. This is the only area along the river which receives camping not related to boating.

Boating campsites receive considerable pressure during the spring but very little use the rest of the year. The Owyhee River is the main thoroughfare through the WSA during the boating season.

Presently, there seems to be little deterioration of the wilderness character of the Lower Owyhee due to floatboaters. However, problems may develop in the future if use continues to increase as it has in the recent past. In part, this growth parallels the general increase in popularity of whitewater sports. As the more popular rivers become overcrowded and as managing agencies respond with increased restrictions on use, boaters look for less crowded rivers with fewer restrictions such as the Owyhee.

The rugged topography, remote location, general lack of roads and trails, climatic hazards, and the high quality of whitewater combine to make the Lower Owyhee Canyon WSA one of the most challenging desert recreation areas in the Intermountain West.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 7,554 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $56,957 annually and local personal income generated by existing outputs amounts to $121,468 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 71,940 acres to the National Wilderness Preservation System (NWPS). The wilderness area would include the plateau above the Owyhee River Canyon, the canyon, riparian lands, raptor habitat, and bighorn sheep habitat.

Opportunities for solitude and primitive recreation would increase with the elimination of motor vehicle travel on about 28 miles of ways. Naturalness would improve as the ways revegetate in response to traffic reduction. Natural revegetation of these ways would lessen their influence upon 2,000 acres. Eliminating unauthorized vehicle use would reduce the potential for vandalism on cultural resources. Potential development of and access to split-estate and private inholdings could adversely affect wilderness characteristics.

Development of private property in the WSA could adversely affect naturalness and opportunities for solitude and primitive recreation, particularly in the northern part of the WSA.

Under the **enhanced wilderness alternative**, 76,800 acres would be added to the NWPS, assuming acquisition of 3,360 acres of split estate and 1,500 acres of private inholdings. Wilderness characteristics would be enhanced by the closure of 7 miles of dead-end roads and 28 miles of ways, as well as acquisition of the inholdings. This would increase opportunities for primitive recreation and solitude. Solitude would be enhanced by the acquisition of a larger area within which visitors could find seclusion. Vehicle-oriented recreation would shift to primitive recreation, which would restore naturalness as the roadbeds revegetate.

Acquisition of split-estate and private inholdings would eliminate the potential for development of these parcels.

Under the **partial alternative**, 49,225 acres would be added to the NWPS, assuming 940 acres of private and 1,625 acres of split estate are acquired. Closure of 5 miles of dead-end roads and 11 miles of ways would enhance opportunities for solitude and primitive recreation, increase naturalness, and protect the area's special wilderness features. Acquisition of split-estate and private land would eliminate the potential for exploration and development of those parcels. The portions of the WSA recommended nonsuitable would continue to be affected by the use of vehicles on existing ways.

Under the **no wilderness/no action alternative**, and in the portions recommended nonsuitable under the partial alternative, any mineral development could adversely affect wilderness values (except in the 9,360 acres withdrawn under the wild river designation). Some adverse effects from oil and gas or geothermal lease development could be mitigated through lease stipulations.

Under the no wilderness/no action alternative, no roads or ways would be closed or reclaimed, potential water project construction could be allowed and all proposed developments on public lands (except for the area within the wild river designation) and on private or state-owned mineral estates could proceed without regard for wilderness characteristics. This would adversely affect naturalness and opportunities for solitude and primitive recreation. Such developments could include construction of powerlines in 4 1/2 miles of a potential utility corridor in the west-central portion of the WSA.

The ACEC and wild river designation would protect ecological and recreational values within the Owyhee River canyon. However, they would not protect lands outside of the canyon from development.

These lands would remain available for mineral and other development, which would adversely affect the area's wilderness values.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Not including the 9,360 acres already withdrawn by the wild river designation, 62,580 acres would be withdrawn by wilderness designations under the **all wilderness alternative**; 62,580 acres under the **enhanced wilderness alternative**, plus an additional 3,980 acres if the private and split-estate land is acquired, as proposed under this alternative; and 37,620 acres under the **partial alternative**, plus an additional 1,685 acres if private and split-estate land is acquired, as proposed, under this alternative.

These withdrawals would include the areas rated moderate for oil and gas, geothermal resources, gold, silver, mercury, bentonite, zeolite, and fluorite which encompass the entire WSA.

No acreage would be withdrawn by wilderness designation under the **no wilderness/no action alternative**. Existing restrictions regarding no mineral location or leasing within 1/4 mile of the Owyhee River (9,360 acres in the WSA) would continue.

Effects on Livestock Grazing

Under the **all wilderness, enhanced wilderness and partial alternatives**, the proposed reservoir, 3 spring developments and the fence might or might not be allowed, depending on a site-specific assessment of whether they would conform with wilderness management policy. If not allowed, 193 AUMs of additional livestock forage and better distribution of livestock in the allotment would be foregone.

These proposed projects have a benefit/cost ratio greater than 1:1.

Since increases in licensed use through allocation of available forage might not be allowed under Wilderness Management Policy, all increases in pastures partially in areas recommended suitable might be foregone. Thus, increases foregone within these pastures would range from 0 to 13,382 AUMs under the all wilderness, enhanced wilderness and partial alternatives.

Motor vehicle restrictions would not significantly affect livestock operators under the all wilderness alternative. The enhanced wilderness and partial alternatives would close the dead-end roads from Bogus Ranch, which are important to the livestock operator. However, the livestock operator would be allowed use of vehicles if it were determined that there were no practical alternative.

Impacts to livestock management under the partial alternative would be the same as the enhanced wilderness alternative.

Under the **no wilderness/no action alternative**, 13,382 AUMs of unallocated forage throughout the pastures would be allocated. The proposed projects would also be allowed, resulting in better livestock distribution and an additional 193 AUMs in the allotment. There would be no vehicle restrictions that would affect livestock operators.

Effects on Utility Corridor Routing

The potential north-south utility corridor would have to be rerouted one mile to the west outside the WSA under the **all wilderness, enhanced wilderness and partial alternatives**. This would not increase the length of the corridor, but it would shift the location of this segment entirely into the Saddle Butte WSA (OR-3-111). (See the Saddle Butte WSA appendix for a discussion of impacts on the corridor if that WSA is designated wilderness.)

Under the **no wilderness/no action alternative,** the utility corridor could be located as proposed.

Effects on Recreation Use

Recreation use would not change under the **all wilderness alternative**.

The **enhanced wilderness and partial alternatives** would inconvenience vehicle-oriented recreationists due to closure of the Bogus and Chalk Basin roads. The net effect on overall recreation use would be small.

Under the **no wilderness/no action alternative recreation** use would not change.

Current recreational use of the river within the WSA would not be adversely affected by any alternative.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments would be constructed if the area were designated wilderness; nor is it known if the grazing increases would be allowed.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, grazing operator access, and/or grazing adjustments were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The **enhanced wilderness and partial alternatives** would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $150 per year.

Table 5. Effects of Alternatives on Annual Economic Value, Lower Owyhee Canyon WSA (OR-3-110) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustments [1]	AUM	0 to +13,382	0 to +13,382	+13,382
Investment [2]	AUM	0 to +193	0 to +193	+193
VALUE OF PLANNED INVESTMENTS [3]				
Grazing	$	0 to +1,455	0 to +1,455	+1,455
Investments [4]	$	0 to +1,015	0 to +1,015	-1,015
Net Economic Value	$	0 to +440	0 to +440	+440
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Grazing:				
Adjustments	$	0 to +100,900	0 to +100,900	+100,900
Reduced access[5]	$	0	-150	0
Total	$	0 to +100,900	-150 to +100,750	+100,900
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	0 to +101,340	-150 to +101,190	+101,340

[1] Adjustments to use currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Structural projects involving up to $12,600 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

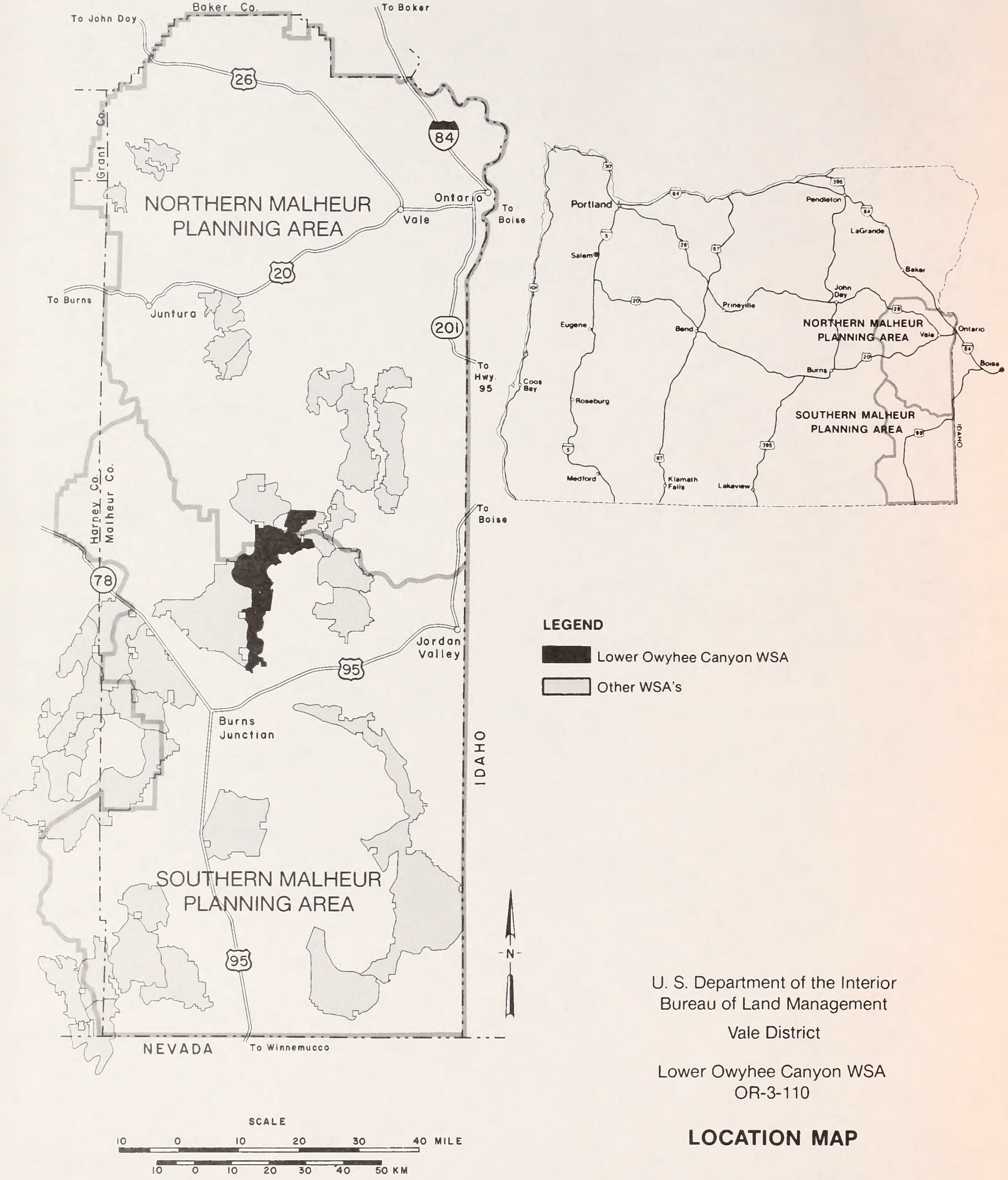
[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 6. Effects of Alternatives on Local Personal Income, Lower Owyhee Canyon WSA (OR-3-110)
(1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustments [1]	AUM	0 to +13,382	0 to +13,382	+13,382
Investment [2]	AUM	0 to +193	0 to +193	+193
VALUE OF PLANNED INVESTMENTS [3]				
Grazing	$	0 to +3,103	0 to +3,103	+3,103
Construction Activity [4]	$	0 to +1,730	0 to +1,730	+1,730
Total [5]	$	0 to +3,103	0 to +3,103	+3,103
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Grazing:				
Adjustments	$	0 to +215,183	0 to +215,183	+215,183
INCOME FROM ALL OUPUT CHANGES				
All categories[5]	$	0 to +218,286	0 to +218,286	+218,286

[1] Adjustments to utilize currently available but unallocated livestock forage.
[2] Expected future increases due to range improvement investments.
[3] Structural projects involving up to $12,600 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.
[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

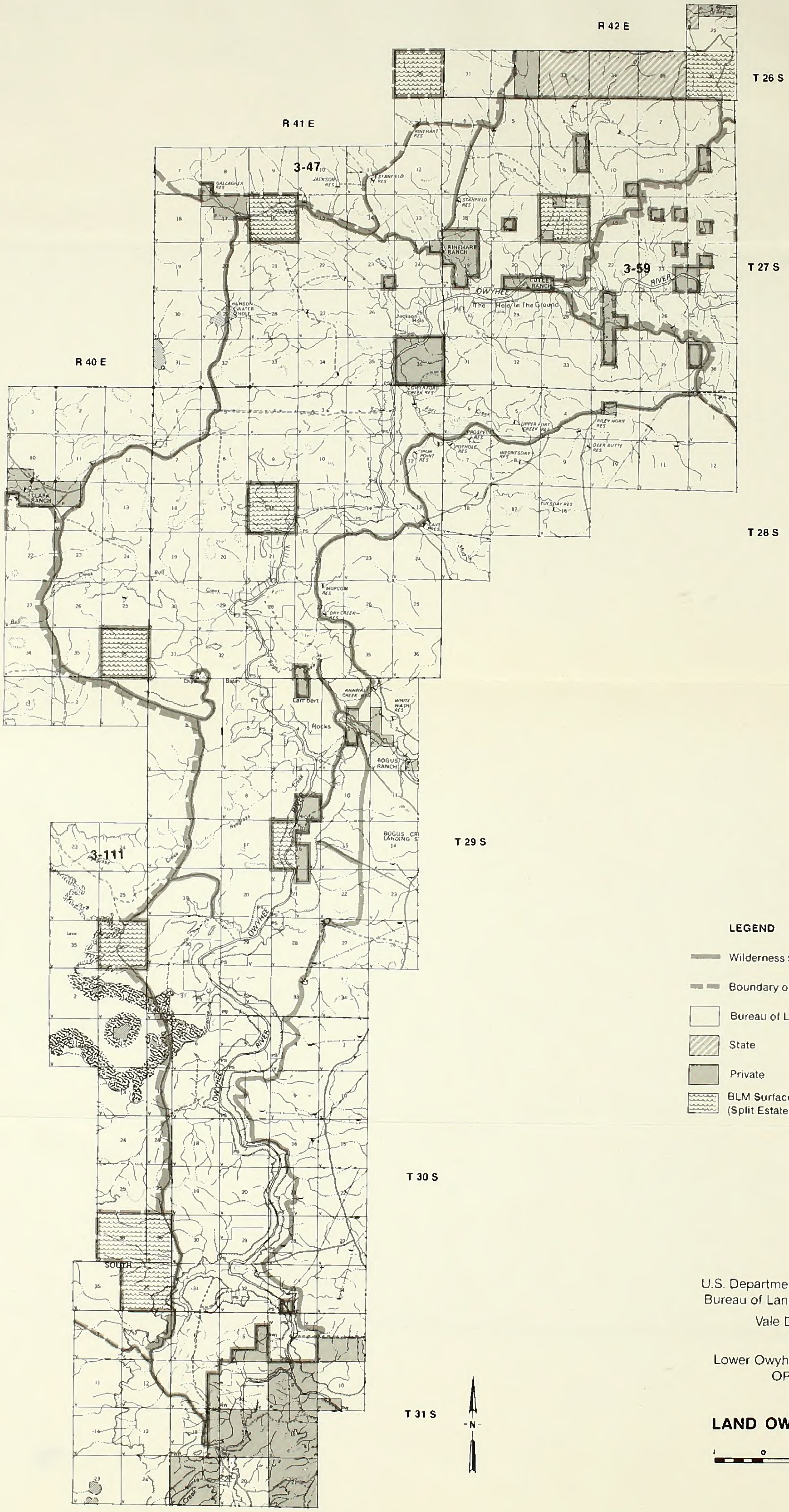


U. S. Department of the Interior
Bureau of Land Management
Vale District

Lower Owyhee Canyon WSA
OR-3-110

LOCATION MAP

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

╍ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ State

▩ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

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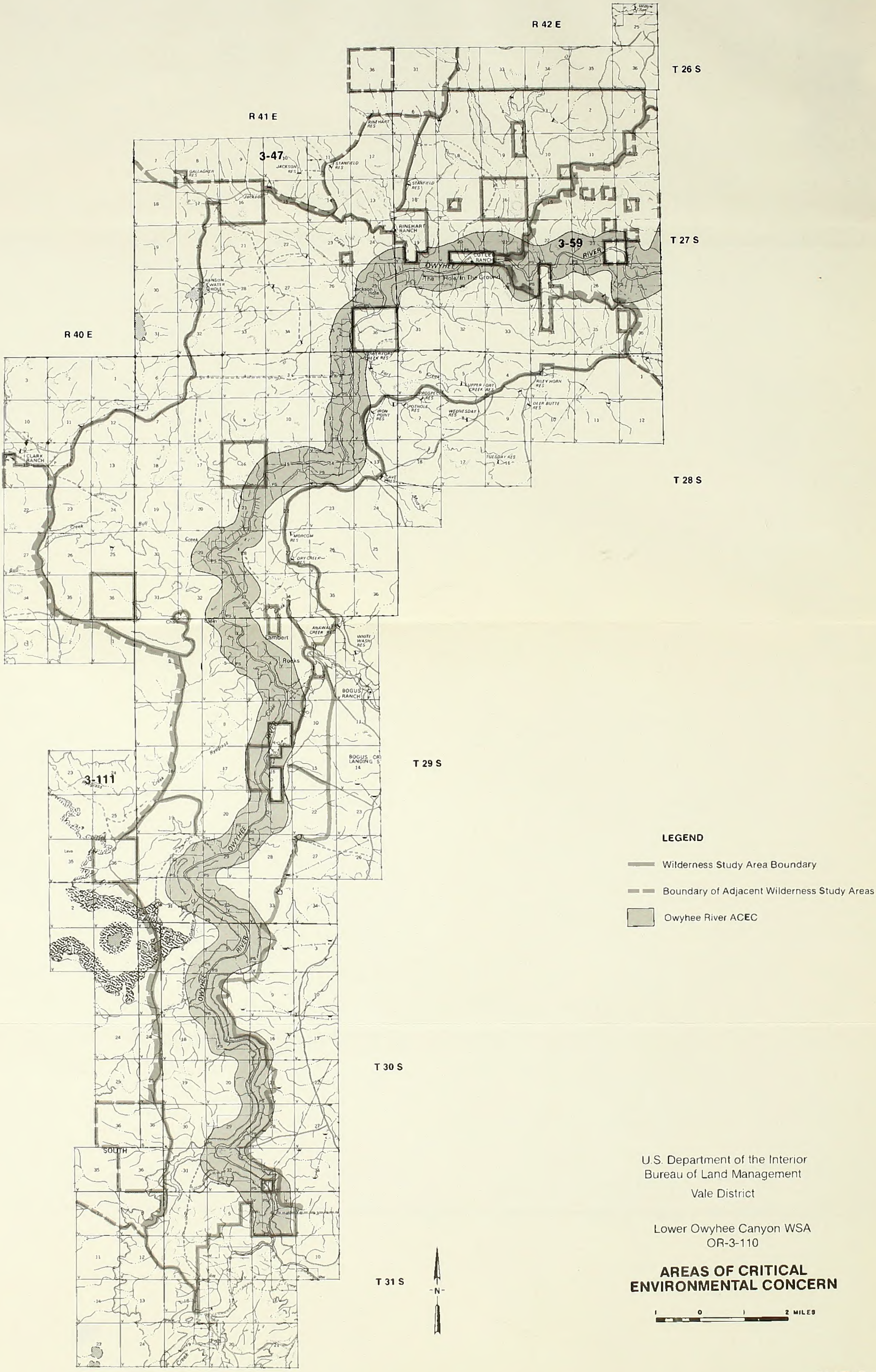
Vale District

Lower Owyhee Canyon WSA
OR-3-110

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



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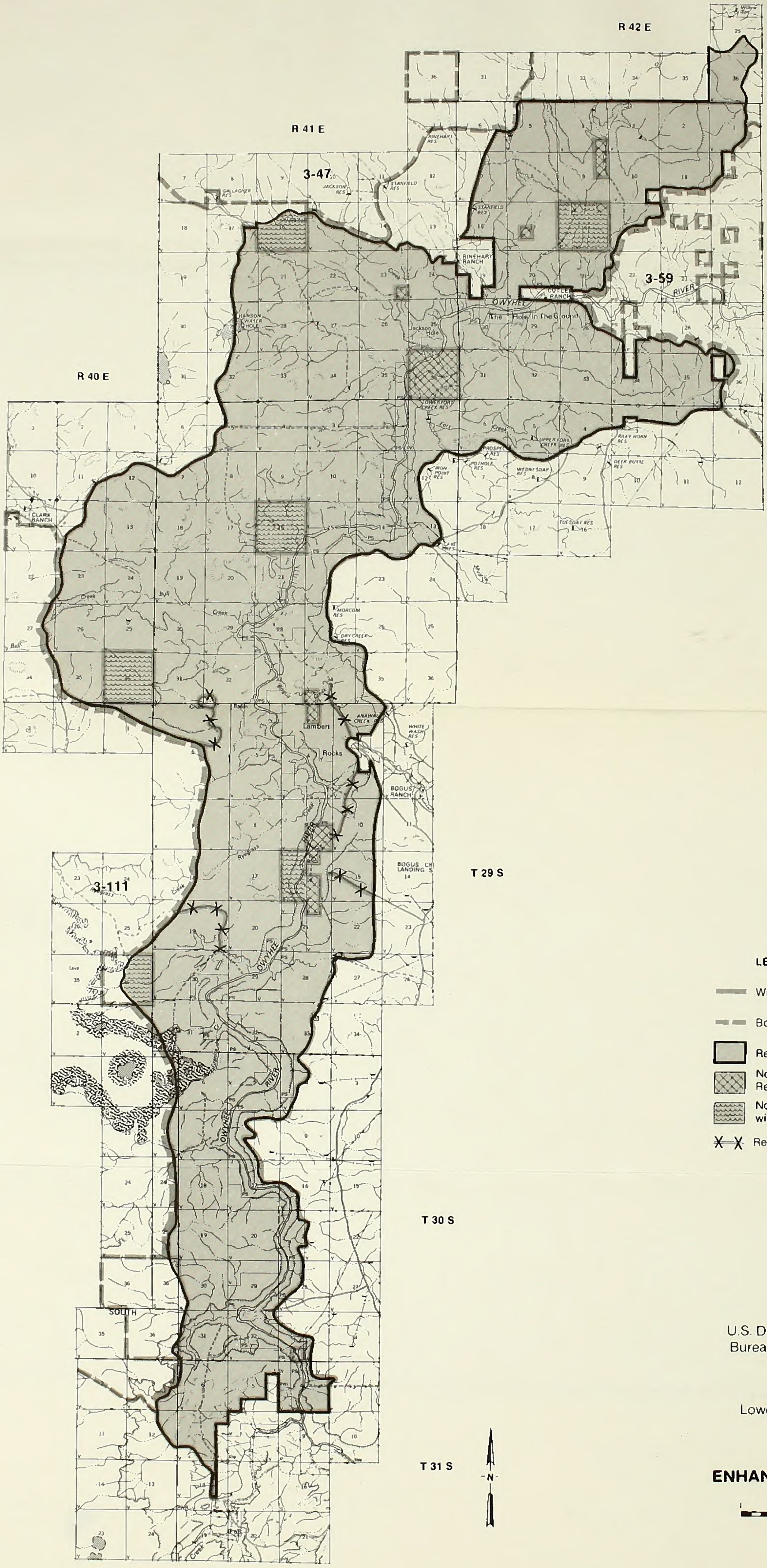
Vale District

Lower Owyhee Canyon WSA
OR-3-110

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

MAP 3



LEGEND

- ▬ Wilderness Study Area Boundary
- ╌ Boundary of Adjacent Wilderness Study Areas
- ☐ Recommended Suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- X—X Recommended Road Closure

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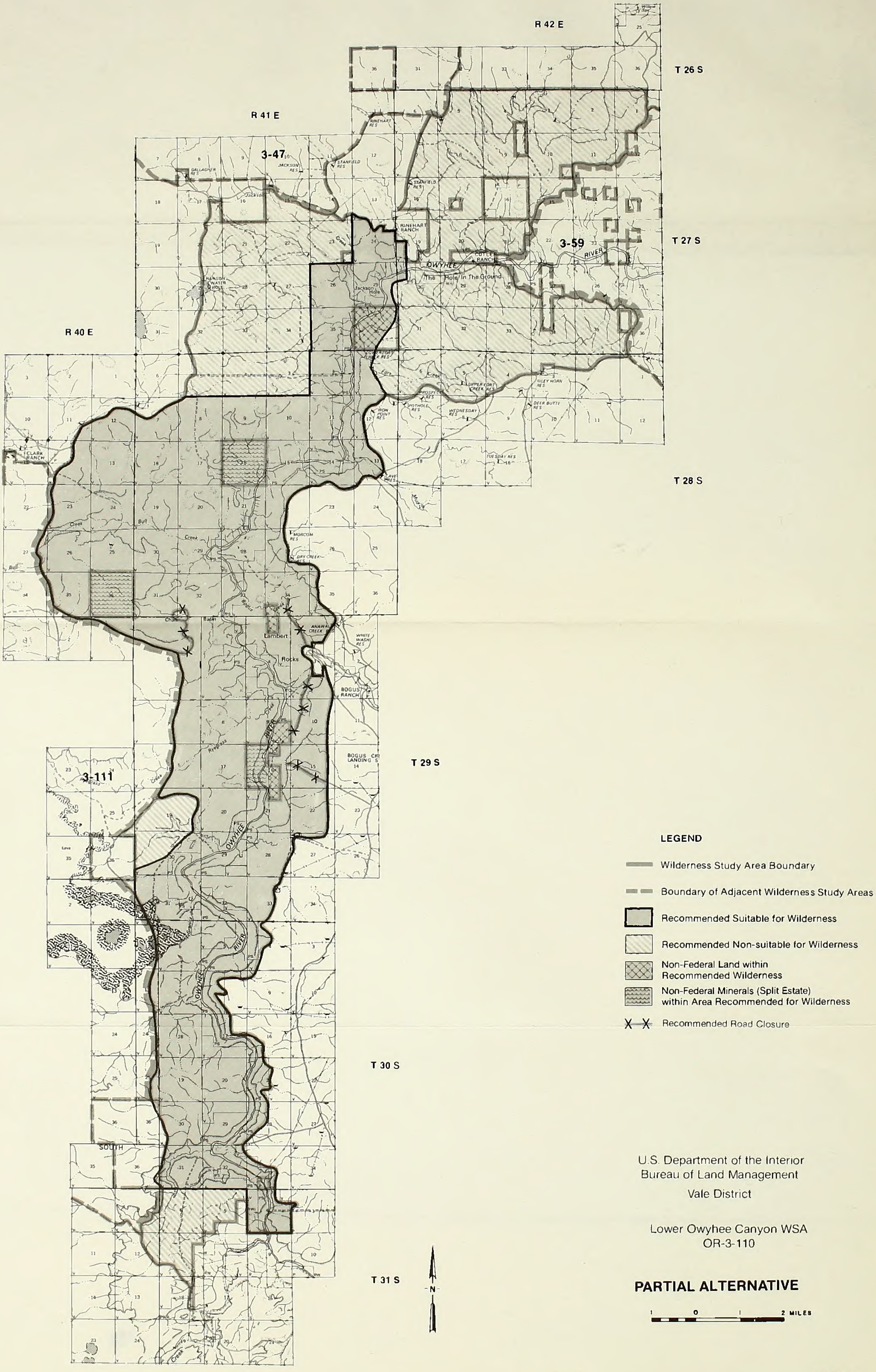
OR-3-110

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 4



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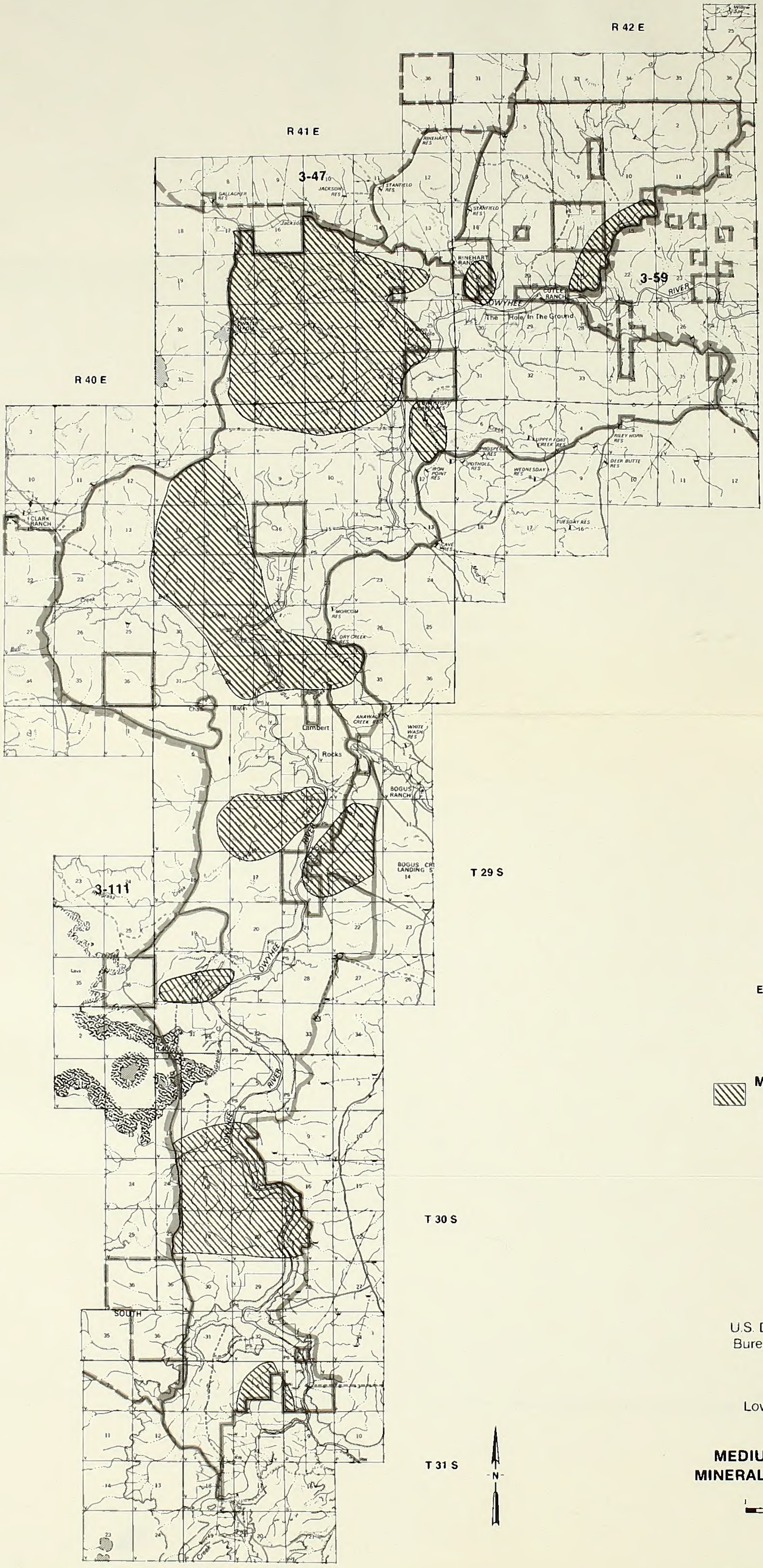
PARTIAL ALTERNATIVE

MAP 5



Entire WSA:
Medium Potential
(3B) for Geothermal Resources, Oil and Gas, Bentonites, Zeolites and Fluorites

▨ **Medium Potential**
(3C) for Gold, Silver and Mercury
(3A) Rest of Area

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MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 6

Lower Owyhee Canyon WSA, OR-3-110. Central portion of the WSA looking southeast along blufffs in Chalk Basin. Within area recommended suitable under the enhanced alternative and partial (preferred) alternative. Lamber Rocks is visible on the far left. September 1983.

Lower Owyhee Canyon WSA, OR-3-110. South central portion of the WSA looking southeast. Within area recommended suitable under the enhanced alternative and partial (preferred) alternative. The seeding above the rim is outside the WSA. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Saddle Butte Wilderness Study Area (OR-3-111)

General Description of the Study Area

The Saddle Butte wilderness study area (WSA) is in Malheur County, approximately 10 miles north of the junction of U.S. Highway 95 and Oregon State Highway 78 (see map 1).

The study area contains 81,300 acres of public land (see map 2). There are three sections totaling 1,920 acres of split estate (federally managed surface, state or privately owned subsurface mineral rights) within the WSA. It is bounded on the south and east by county roads. The northwest boundary of the WSA borders State of Oregon land. Eight parcels of split estate form portions of the boundary.

The WSA is roughly triangular in shape and contains three distinct landforms. The northern half of the WSA is a relatively high, flat plateau that slopes gradually toward Bull Creek to the east and Ryegrass Creek to the south. The south-central portion is a lava flow which forms a wide band of rough-surfaced ridges, hillocks, depressions and lava tubes. The southeastern tip of the WSA is relatively flat lowland, except for a few erosional channels along the eastern boundary. Much of the WSA drains east directly into the Owyhee River. The generally flat topography traps runoff in small, shallow lake beds which are usually dry by early summer. Tub Springs is the only perennial water source in the area.

The major plant community in the WSA is sagebrush-bluebunch wheatgrass, with some fire-related subclimax communities (climax is the relatively stable, final stage in the succession of vegetation types) intruding along the eastern boundary. Herbaceous vegetation dominates the lava flow, and there are some areas of shadscale and Indian rice grass along the southeastern boundary.

Interrelationships

The Lower Owyhee Canyon WSA (OR-3-110) is adjacent to the eastern boundary of the Saddle Butte WSA. The two WSAs are separated by a county road.

Within the WSA lies the Saddle Butte Lava Tubes Area of Critical Environmental Concern (ACEC) (see map 2). This 7,040-acre area contains over eight miles of known lava tubes which for the most part have collapsed, leaving only short segments intact. Eighteen uncollapsed segments are accessible.

Special management provisions to protect the caves from accelerated erosion, to protect humans from the hazards of tube collapse, and to protect the uncollapsed tubes from surface disturbing activities include:

- restricting surface disturbing activities on or contiguous with known or suspected tubes,

- erecting roadside barriers and signs where needed to discourage public access to the area, and

- maintaining existing roads to the extent necessary to manage the resources in and adjacent to the area, but constructing no new roads.

These restrictions would continue to apply in the portion of the WSA designated an ACEC, whether or not the area is designated wilderness.

The Oregon Department of Fish and Wildlife (ODFW) conducts an annual census by airplane of wintering antelope in the area.

Most of the WSA is in the Sand Springs wild horse herd management area (HMA). HMA management, including the use of an established trap site, will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- vehicle access to the lava tubes for scientific study and recreational enjoyment,

- development of existing and potential mineral rights,

- the WSA's outstanding solitude and primitive recreational opportunities (caving, sightseeing, horseback riding and photography), special features (lava tubes) and high degree of naturalness,

- management of wild horses in the area (see Statewide EIS volume), and

- possible designation of a north-south utility corridor through the eastern portion of the WSA.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- partial
- no wilderness/no action (preferred alternative)

An enhanced wilderness alternative, which would combine the Saddle Butte WSA with the Lower Owyhee Canyon WSA, is not analyzed because the county road dividing these two WSAs cannot be closed; it is the only north-south transportation route immediately north of Rome, Oregon, and west of the Owyhee River. Acquisition of six split-estate parcels is analyzed under the partial alternative.

All Wilderness

Under the all wilderness alternative, all 81,300 acres of public land in the Saddle Butte WSA would be recommended suitable as wilderness (see map 2). For purposes of analysis, it is assumed the split estate in and adjacent to the WSA would not be acquired.

Partial

The partial alternative would recommend 58,080 acres suitable as wilderness (see map 3). In addition, an attempt would be made to acquire six interior and adjacent parcels of split estate totaling 3,720 acres. These parcels could be acquired through purchase or exchange with willing owners. If the acquisitions were successful, total area recommended suitable under this alternative would be 61,800 acres.

Some 23,220 acres along the eastern boundary of the WSA would be recommended nonsuitable under this alternative.

The boundary on the east side would follow legal subdivisions from north to south. The boundary along the southwestern side would include portions of three adjacent parcels of split estate, if they could be acquired.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued restriction of ORV use to existing routes,
- continued availability for mineral exploration and development,
- possible development of a potential north-south utility corridor.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

Areas designated wilderness under both the all wilderness and partial alternatives would be manageable as wilderness. A manageability problem could arise if mineral development occurred on the split-estate land. The probability of such development can only be surmised based on the area's mineral potential (see Energy and Minerals section of Affected Environment). Use of the horse trap road would complicate management of the southeast corner of the area under the all wilderness alternative.

Table 1. Summary of Proposed Management Under Each Alternative, Saddle Butte WSA (OR-3-111)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	81,300	58,080	0
Acres Closed to ORVs by Wilderness Designation	81,300	58,080	0
Miles of Ways Closed	14	8	0
Acres of Split Estate Acquired [1]	0	3,720	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	81,300	58,080	0
Structural Wildlife Projects Developed: Catchments and Guzzlers (number)	0-9	1-9	9
Unallocated Existing Forage Allocated (AUMs)	0-10,831	0-10,831	10,831
Restrictions on Potential Utility Corridors (miles added)	9.3	0	0

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Rationale for the Selection of Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits to be gained from allowing the proposed range, wildlife, and public utility projects, exploration for and possible development of possible mineral resources, and continued vehicle access to the caves for research purposes would outweigh the benefits of preserving the area's wilderness values. These projects would be allowed under the no wilderness/no action alternative. The potential for mineral development on the split-estate inholdings could make management of the area as wilderness difficult.

The lava caves have been designated as an Area of Critical Environmental Concern which would protect this unique environment from developments other than mining.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Saddle Butte WSA exhibits a very high degree of naturalness. The large central portion is virtually devoid of signs of human activity. Sixteen man-made features influence less than 2 percent of the WSA. (The area of influence is an estimate of the acreage within the WSA from which these features can be seen.)

The man-made features include 3 reservoirs, 4 guzzlers (small, wildlife watering devices), 7 ways (vehicle routes established and maintained solely by the passage of vehicles) totaling 14 miles, and a horsetrap and its 4-mile access road. One reservoir is located in the western portion of the WSA; one reservoir and a 1/2-mile long access way are located in the northern portion; the horsetrap and

Table 2. Summary of Environmental Consequences of Alternatives, Saddle Butte WSA (OR-3-111)

Resource or Activity	All Wilderness	Partial	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 81,300 acres to NWPS. Maintains wilderness characteristics of highly natural lava features, lava tables, wild horses, and wildlife habitat. Closure of 14 miles of ways would enhance wilderness values. Area would be manageable as wilderness.	Would add 61,800 acres to the NWPS, assuming 3,720 acres of split-estate land could be acquired. Possible adverse effects on wilderness characteristics in nonsuitable portion due to utility corridor and mineral development. Closure of 8 miles of ways would enhance wilderness values. Area would be manageable as wilderness.	Continued protection of lava tubes in ACEC, except the ACEC would remain open to mining. The rest of area's wilderness characteristics would be subject to localized adverse impacts from possible construction activities of potential utility corridor and possible mineral development.
Energy and Mineral Developement	Development precluded on 81,300 acres, including 81,300 acres with moderate potential for oil and gas and 4,900 acres with moderate potentail for gold and molybdenum.	Development precluded on 58,080 acres, plus an additional 3,720 acres if acquired. Includes 58,080 acres with moderate potential for oil and gas and 4,130 acres with moderate potential for gold and molybdenum.	No impact.
Soils	No impact.	Possible localized erosion from utility corridor development in nonsuitable portion.	Possible localized erosion from utility corridor development.
Wildlife	Wildlife habitat preserved. If guzzlers not allowed, increase in deer and bird populations would be foregone.	Wildlife habitat preserved in suitable portion. If eight guzzlers in suitable portion not allowed, increase in deer and bird populations would be foregone. Other guzzler located outside suitable area could be constructed. Wildlife could be disturbed in eastern portion of WSA from possible utility corridor development.	Guzzlers would be built resulting in an increase in deer, chukar, quail and dove populations. Wildlife could be disturbed along eastern portion of WSA due to possible utility corridor development.
Livestock Grazing	Allocation of 10,831 AUMs of available forage in pastures might be foregone.	Same as all wilderness.	Increase of 10,831 AUMs in pastures through allocation of existing forage.
Utility Corridor Routing	Route of potential utility corridor would have to be located around west side of WSA, increasing construction and annual costs.	Utility corridor could be routed as proposed.	Utility corridor could be routed as proposed.
Recreation Use	Localized decrease in use of lava tubes. Possible modest increase in hunting use from the construction of wildlife guzzlers. No change in overall recreation use.	Same as all wilderness.	Modest increase in hunting from construction of wildlife guzzlers. Possible decrease in primitive recreation if utility corridor is constructed. A slight net increase in overall recreation use.
Economic Value and Local Income	Changes in annual economic value could range from a loss of $185 to an increase of as much as $81,494, depending on what proposed projects and grazing increases would be allowed in wilderness. Effects on local personal income would range from no change, to an increase of $174,851, depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use. The maximum increase in transportation costs to livestock operators would be $172. There would be increased costs from rerouting the utility corridor.	Changes in annual economic value could range from a loss of $185 to an increase of $81,497 depending on what proposed projects and grazing increases would be allowed in wilderness. Local personal income would increase by $78 to $174,851, depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use. The maximum increase in transportation costs to livestock operators would be $172.	Increase in economic value and local personal income by $81,653 and $174,851, respectively, from construction of all proposed projects, and from adjustments to use currently available but unallocated forage.

the temporary dead-end road leading to it are located in the southeastern corner; and two ways and one reservoir are located in the center of the WSA. One way provides access from the southwestern boundary road approximately 2 1/2 miles into the WSA to several caves. The other way provides access from the northern boundary 1 1/2 miles into the WSA to a reservoir.

There are no outside sights or sounds that substantially influence the naturalness of the WSA.

Opportunities for Solitude or Primitive and Unconfined Recreation

The WSA's large size and the exceedingly rough and broken terrain of the Saddle Butte Lava Field provide significant topographic screening and outstanding opportunities for solitude. However, plateaus to the north and south of the Saddle Butte Lava Field are generally too flat to provide topographic screening. Little vegetative screening is provided anywhere in the WSA. The limited screening and the narrowness of the northern and northwestern extensions limit opportunities for solitude in these areas.

Outside sights and sounds include military jets on simulated low level bombing runs, traffic on State Highway 78 (southern boundary) and ranching activities at the Clark Ranch (northern boundary) and Ryegrass Ranch (western boundary). Most of the intrusions upon solitude from outside sights and sounds are brief, or are very distant, and their impacts do not penetrate far into the WSA.

There are outstanding opportunities for cave exploration in the Saddle Butte WSA. Twenty-two cave segments have been identified and mapped, verifying the Saddle Butte lava tube system as one of the most extensive in Oregon.

Opportunities for geologic sightseeing and photography are excellent in the lava cave area. Herds of wild horses, scattered mule deer and wintering pronghorn antelope roam the flatter sections of the WSA and provide excellent opportunities for observing and photographing wildlife. Horseback riding opportunities are considered to be excellent throughout the WSA.

There are also opportunities for educational and scientific endeavors in the lava caves.

Special Features

The most notable special wilderness feature in the WSA is the extensive system of lava tubes which winds through the Saddle Butte Lava Field. The system is approximately 8 to 10 miles long and includes at least 22 uncollapsed cave segments. The cave system exceeds the combined length of two other lava tube systems within Oregon. Most of the system lies within the Saddle Butte WSA.

The caves of the Saddle Butte system provide excellent habitat for Townsend's big-eared bats. Populations of this species are limited in number and seem largely limited to the lava tube caves. The caves also include small areas of constant temperature and humidity, unique conditions which promote the growth of mosses and ferns normally considered to be alien to the dry climate.

The WSA contains the northernmost habitat of the kit fox, which is on ODFW's list of threatened species.

No cultural resource surveys have been conducted in the WSA but surveys of the nearby Owyhee River and the split-estate parcels have identified several hundred archeological sites. It seems likely, therefore, that the Saddle Butte area may contain significant antiquities.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and its potential natural vegetation is sagebrush steppe and saltbush-greasewood. Of the plant communities listed in the Owyhee Upland section of the Oregon Natural Heritage Plan, the WSA has sagebrush/bluebunch wheatgrass and alkaline vegetation mosaic with representative communities including greasewood, shadscale, saltbush and spiny hopsage.

Boise, Idaho is the only standard metropolitan statistical area with population over 100,000 within five hours' driving time of the WSA.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment and rock chip sampling by BLM geologists. Technical details of the findings of the evaluation are in a BLM report, "Assessment of Geology, Energy, Mineral Resources of Saddle Butte Geologic Resource Area."

The WSA is within the Saddle Butte geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is rated moderately favorable for oil and gas, and parts are moderately favorable for gold and molybdenum.

The mineral potential classifications for the WSA are shown in table 3. Map 4 shows the portions rated moderate (medium) for gold and molybdenum.

Oil and gas and geothermal are the two main potential energy resources in the area. Because of youthful volcanism and above-normal heat flow, most of southeastern Oregon is generally considered favorable for thermal waters for high temperature geothermal resources. None have been identified within the WSA. Oil and gas potential will largely depend on the presence or absence of suitable marine rock at the subsurface. There has been no deep drilling in the vicinity which has penetrated the Tertiary volcanic cover.

Table 3. Classification of Energy and Mineral Potential, Saddle Butte WSA (OR-3-111)

Commodity	Area	Classification Level	Confidence Level
Metals			
Gold, molybdenum	See map 4	3	B
Gold	Rest of WSA	2	A
Geothermal	Entire WSA	2	B
Uranium/Thorium	Part of area (not shown on map)	2	B
Coal	Entire WSA	1	C
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite, Diatomite, Zeolites	Part of area (not shown on map)	2	B
	Rest of WSA	1	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

As of January 1, 1984, there were no geothermal or oil and gas leases in the WSA and there were no mining claims.

Aside from road aggregate sources there are few known mineral deposits within a 10-mile radius from the WSA. Exceptions are the large bentonite, diatomite, zeolite and fluorite deposits in the vicinity of Rome, Oregon, in lake sediments, about five miles to the southeast of the WSA. Explorations for low-temperature hydrothermal gold deposits earnestly began in parts of Malheur County during the past two years. Large gold deposits have been found in similar geologic settings in California and Nevada.

The surface rocks in the WSA consist of continental Tertiary formations associated with volcanics, shallow intrusives, volcano-related sediments, playa and lake deposits. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depth.

Vegetation

Most of the WSA is in a Wyoming big sagebrush/bluebunch wheatgrass vegetative community, with the remainder in a shadscale/Indian ricegrass community. Most of the vegetation is in a mid-seral stage; a small amount is in an early-seral stage and a late-seral stage. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation.)

Soils

Most of the soils along the eastern portion of the WSA are highly erodible and susceptible to erosion from surface disturbing activities.

Wildlife

The Saddle Butte WSA offers a variety of habitats for mammals typical of the sagebrush steppe ecosystem. Over 600 head of antelope use the northern third of the WSA during the winter, making it the most important antelope winter range in southeastern Oregon. Mule deer and coyote are found throughout the WSA. The WSA is part of the northernmost range of the kit fox, on ODFW's list of threatened species.

The lava breaks, caves, and tubes in the central part of the unit are habitat for desert woodrats, yellow-bellied marmots, and bobcats. At least four species of bats have been observed in the WSA, including a large number of the Townsend's big-eared bat, a species considered very uncommon very uncommon and restricted to caves.

Four guzzlers to provide water for wildlife have been developed in the WSA and construction of nine more has been proposed.

Livestock Grazing

A portion of one grazing allotment is within the WSA. Table 4 summarizes existing and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Existing livestock developments in the WSA (among the man-made features mentioned in the Naturalness section) include 3 reservoirs.

Licensed livestock grazing in pastures wholly or partially in the WSA is proposed to be increased by 10,831 AUMs by allocating available forage. Increases in the WSA would vary according to the amount of pasture in the WSA and other factors such as terrain and vegetation.

Nearly all motor vehicle use by livestock operators in this area is along the eastern boundary road of the WSA. Salting is not needed in this allotment (Barren Valley is a winter range and the desert shrubs have a high salt content) and the movement and checking of cattle is handled mostly on horseback.

Utility Corridor Routing

The Bonneville Power Administration (BPA) has under long-term consideration construction of a 500-kV power transmission line through a potential north-south corridor which would cross the eastern edge of the Saddle Butte WSA.

Recreation Use

The major recreational attraction of the WSA is the lava cave system. Vehicle access to the caves is via a 2 1/2-mile way entering from the study area's southwestern boundary. Very little hunting occurs within the WSA.

Even though most of the area outside the lava field is accessible to off-road vehicles, little use occurs. ORV use is currently limited to existing routes by the current land use plan.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 2,762 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $20,825 annually, and local personal income generated by existing outputs amounts to $44,413 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Table 4. Existing and Potential Livestock Use, Saddle Butte WSA (OR-3-111)

Grazing Allotment	Licensed Aums in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Available but Unallocated Forage in Pastures (AUMs)
Barren Valley Common (No. 0801)	10,237	11/01-3/31 [1]	19	2,762	10,831

[1] The East Ryegrass Pasture (western portion of the WSA) is often used in conjunction with adjoining Sheepshead allotment, at which times it is grazed lightly during May, June and/or July.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 81,300 acres to the National Wilderness Preservation System (NWPS). The vast expanses of sagebrush steppe and saltbush-greasewood and the special wilderness features would be assured protection from future human disturbance with the possible exception of mineral development on any potential valid existing claims and on split-estate lands within the area. Vehicular access to these split-estate tracts in the event of mineral exploration or development could further affect wilderness values of the WSA. The probability of mineral development of the split-estate inholdings can only be surmised based on the area's rated mineral potential. Closure of 14 miles of ways would enhance wilderness values.

Fragile ecosystems associated with the lava caves would receive slightly less recreational use due to the closure of the access way. The wild horse trap and gathering operation would continue to affect wilderness values.

The **partial alternative** would add 61,800 acres to the NWPS assuming the 3,720 acres of interior and adjacent split estate could be acquired as proposed under this alternative. Acquisition of these parcels parcels would eliminate the possibility of mineral development on these parcels adversely affecting wilderness values on adjacent public lands. This would also eliminate the possible need for vehicle access to the parcels across the area recommended for wilderness. Closure of 8 miles of ways would enhance wilderness values.

A strip along the eastern boundary varying from 1 1/2 to 3 miles wide comprising 23,220 acres would be recommended nonsuitable. Wilderness values would be adversely affected in this area if the proposed utility corridor were developed or mineral deposits were mined. Approximately 12 1/2 miles of powerline could be constructed across the area.

The majority of the horsetrap access road would not influence the wilderness area's naturalness since it would be excluded from the area recommended suitable under this alternative. It would continue to detract from naturalness in the area recommended nonsuitable.

Under the **no wilderness/no action alternative**, the area's naturalness, opportunities for solitude and primitive recreation, and special wilderness features could be adversely affected by exploration and development of mineral resources and development of the utility corridor.

The ACEC management plan for the lava tubes affords some protection for this unique resource. However, it does not withdraw them from mineral exploration or development, which could leave them susceptible to adverse impacts resulting from such development.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 81,300 acres under the all wilderness alternative, and 58,080 acres plus an additional 3,720 acres if the split-estate is acquired, as proposed under the partial alternative.

These withdrawals would include the area rated moderate for oil and gas, which encompasses the entire WSA. Both portions rated moderate for gold and molybdenum, totaling 4,900 acres, would be included in the withdrawal under the **all wilderness alternative**; under the **partial alternative**, only one of the two areas rated moderate for gold and molybdenum, 4,130 acres in the northwest corner, would be included in the withdrawal.

Effects on Soils

No changes would occur in the **all wilderness alternative** and suitable portion of the partial alternative.

Under the **partial and no wilderness/no action alternatives**, the highly erodible soils along the eastern edge of the WSA could be disturbed and subjected to wind and water erosion associated with road and tower construction along the length of the potential utility corridor.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

There would be little change in game animal populations under the **all wilderness alternative**.

Under the all wilderness alternative, nine guzzlers proposed for this area might or might not be allowed depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If not allowed, an opportunity to increase deer, chukar, quail and dove populations would be foregone. Four existing guzzlers could probably be maintained without the use of motor vehicles.

Under the **partial alternative**, the environmental consequences for the suitable portion of the WSA would be the same as under the all wilderness alternative. The wildlife populations and habitats in the eastern nonsuitable portion of the WSA would be subject to disturbances from possible construction of powerlines. In particular such activities could damage kit fox habitat and possibly cause the fox to avoid the area. One of the nine guzzlers proposed to increase deer, chukar, quail and dove populations would be in the nonsuitable portion and could be constructed. The other eight might or might not be allowed.

Under the **no wilderness/no action alternative**, wildlife would be subject to the same possible disturbance as in the partial alternative. The annual census of antelope by ODFW could continue unrestricted. All nine proposed guzzlers would be developed, with a resulting increase in deer, chukar, quail and dove populations.

Effects on Livestock Grazing

Since increases in licensed use through allocation of available forage might not be allowed under Wilderness Management Policy, all increases in pastures partially in areas recommended suitable might be foregone. Thus, increases foregone within these pastures would range from 0 to 10,831 AUMs under the **all wilderness and partial alternatives**. Maintenance of existing range improvement projects could continue subject to Wilderness Management Policy. Vehicle restrictions within the WSA would not significantly affect livestock operators.

Under the **no wilderness/no action alternative**, an allocation of 10,831 AUMs of available forage throughout the pastures would be realized.

Effects on Utility Corridor Routing

Under the **all wilderness alternative**, the potential north-south utility corridor for a power transmission line could not be located within the WSA. An alternative corridor location around the west side of the WSA would be 9.3 miles longer, increasing construction costs by some $2,539,000 to $3,532,000, depending on type of line design, and increasing annual costs by some $138,000 to $268,000. (See Statewide EIS volume for explanation of these figures.)

Under the **partial and no wilderness/no action alternatives**, the utility corridor could be located as proposed.

Effects on Recreation Use

Under the **all wilderness alternative**, motor vehicle restrictions associated with wilderness designation would substantially affect visitors to the lava tubes and caves. Spelunkers (cave explorers) reach much of the cave area via a way that extends 2 1/2 miles into the lava flow from the southwestern boundary road. Closing the way would mean that spelunkers would have to hand carry or horsepack heavy, cumbersome caving equipment between the boundary roads and the caves. A decrease in use would result. Some spelunkers would be discouraged, but dedicated cavers will accept the added inconvenience and continue to visit the area. Wilderness designation should not cause a sudden increase in popularity of the caves, particularly among spelunkers.

On the whole, wilderness designation would not substantially change present recreation use trends. If wildlife guzzlers are allowed, hunting use would increase moderately. By precluding location of a proposed utility corridor in the eastern edge of the WSA, the all wilderness alternative would eliminate the possibility of visitors being disturbed by associated construction activities. It would also mean the area would not be opened up to vehicles along construction access ways.

Under the **partial alternative**, motor vehicles would be limited to existing routes in a large swath along the eastern edge of the WSA. The overall effects on recreation would be the same as under the all wilderness alternative, except one wildlife guzzler would be allowed, thereby increasing hunting use slightly.

If the proposed utility corridor were developed under the partial or no wilderness/no action alternatives, construction activities or vehicle use in the corridor could adversely affect opportunities for both solitude and primitive recreation. This is not expected to affect overall recreation use. Overall recreation use would not change under this alternative.

Under the **no wilderness/no action alternative**, all recreation activities would continue at present levels except that a moderate increase in hunting would be realized by the construction of 9 wildlife guzzlers. Solitude and primitive recreation opportunities could be slightly reduced by possible construction within the proposed utility corridor and would continue to be adversely affected by the use of motor vehicles, especially along the cave area access way in the lava flow. Overall recreation use would increase slightly.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the 9 guzzlers proposed for this WSA, would be constructed if the area were designated wilderness; nor is it known if the grazing increases would be allowed.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, grazing operator access, and/or grazing adjustments were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The **all wilderness and partial alternatives** would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $172 per year.

Bonneville Power Administration would incur higher costs under the all wilderness alternative as a result of rerouting the utility corridor around the WSA.

Table 5. Effects of Alternatives on Annual Economic Value, Saddle Butte WSA (OR-3-111) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing: Adjustments [1]	AUM	0 to +10,831	0 to +10,831	+10,831
Big game hunting	RVD	0 to +28	+3 to +28	+28
Upland game hunting	RVD	0 to +34	+4 to +34	+34
VALUE OF PLANNED INVESTMENTS [2]				
Big game hunting	$	0 to +635	+68 to +635	+635
Upland game hunting	$	0 to +1,065	+125 to +1,065	+1,065
Total [3]	$	0 to +1,700	+193 to +1,700	+1,700
Investments [4]	$	0 to -1,713	-190 to -1,713	-1,713
Net Economic Value [5]	$	-13 to 0	-13 to +3	-13
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Grazing: Adjustments	$	0 to +81,666	0 to +81,666	+81,666
Reduced access [6]	$	-172	-172	0
Total	$	-172 to +81,494	-172 to +81,494	+81,666
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-185 to +81,494	-185 to +81,497	+81,653

[1] Adjustments to use currently available but unallocated livestock forage.

[2] Structural projects involving up to $18,000 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Detail may not sum to "Total" due to rounding.

[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[5] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

[6] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 6. Effects of Alternatives on Local Personal Income, Saddle Butte WSA (OR-3-111) (1981 price levels)

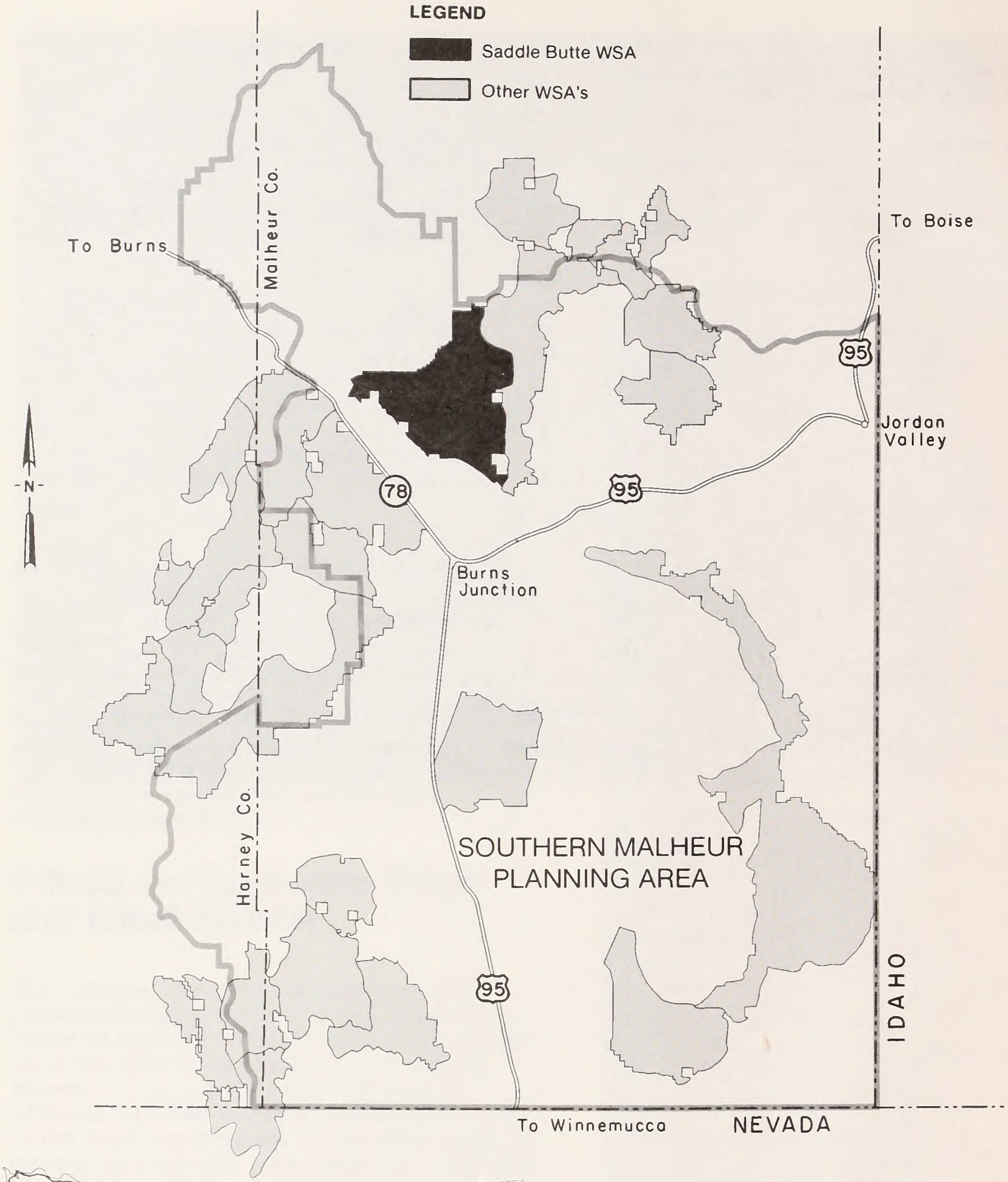
Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustments [1]	AUM	0 to +10,831	0 to +10,831	+10,831
Big game hunting	RVD	0 to +28	+3 to +28	+28
Upland game hunting	RVD	0 to +34	+4 to +34	+34
INCOME FROM PROPOSED INVESTMENTS [2]				
Big game hunting	$	0 to +238	+25 to +238	+238
Upland game hunting	$	0 to +451	+53 to +451	+451
Construction activity [3]	$	0 to +2,477	+275 to +2,477	+2,477
Total [4]	$	0 to +689	+78 to +689	+689
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Grazing:				
Adjustments	$	0 to +174,162	0 to +174,162	+174,162
INCOME FROM ALL OUTPUT CHANGES				
All categories [4]	$	0 to +174,851	+78 to +174,851	+174,851

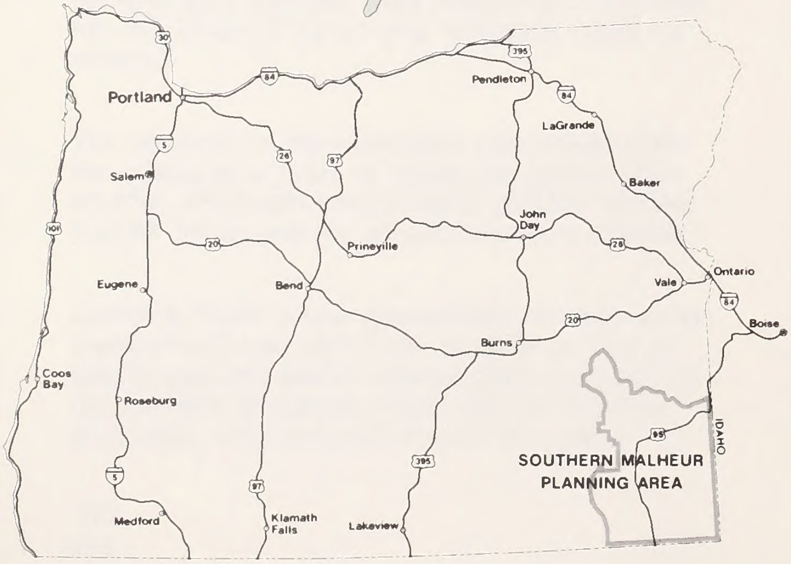
[1] Adjustments to utilize currently available but unallocated livestock forage.

[2] Structural projects involving up to $18,000 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from hunting activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 2.





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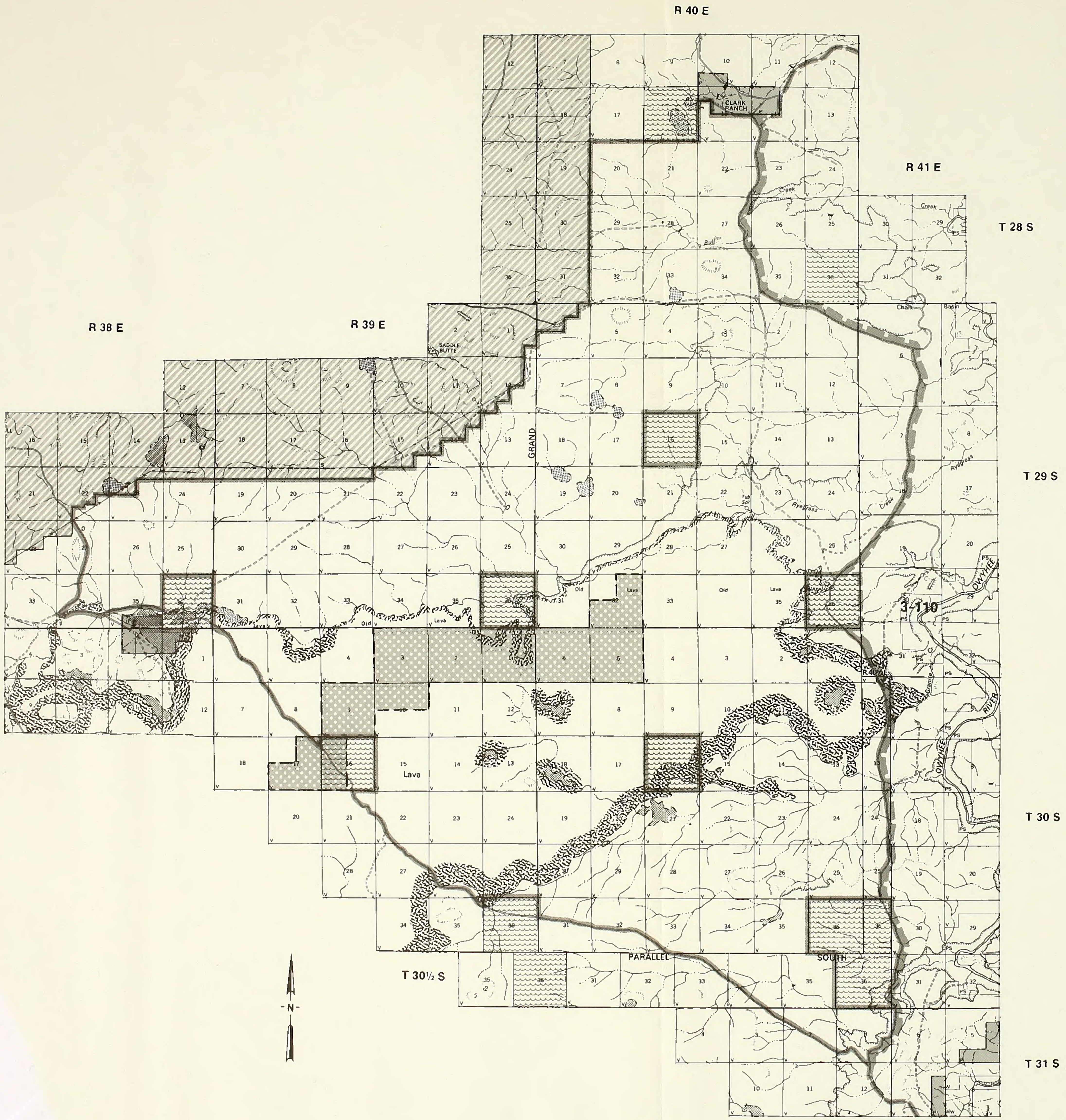
Vale District

Saddle Butte WSA
OR-3-111

LOCATION MAP

MAP 1



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▨ State
- ■ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)
- ░ Saddle Butte Area of Critical Environmental Concern
- ▩ Edge of Lava

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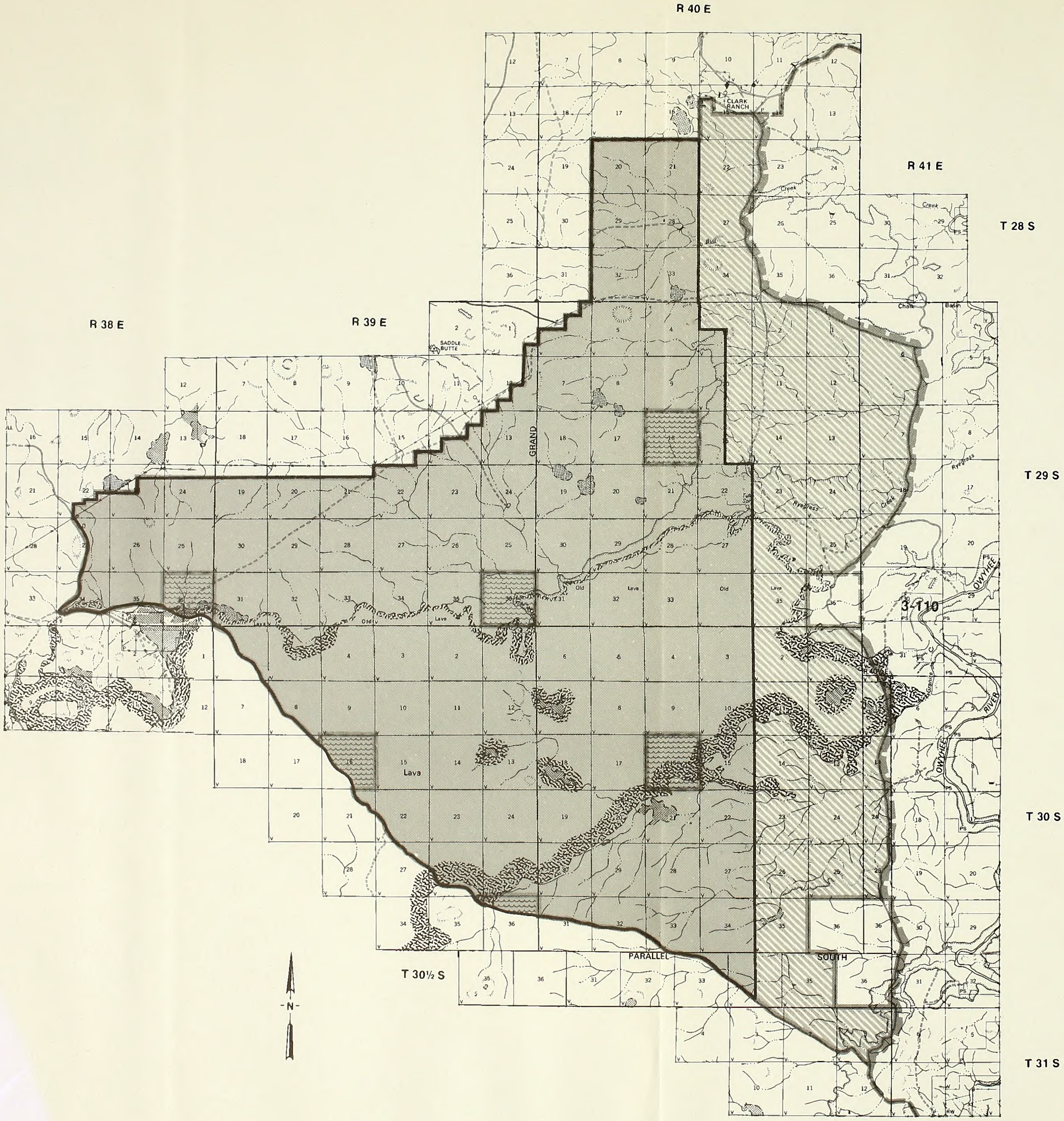
Saddle Butte WSA
OR-3-111

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study Areas
- ▢ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▦ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

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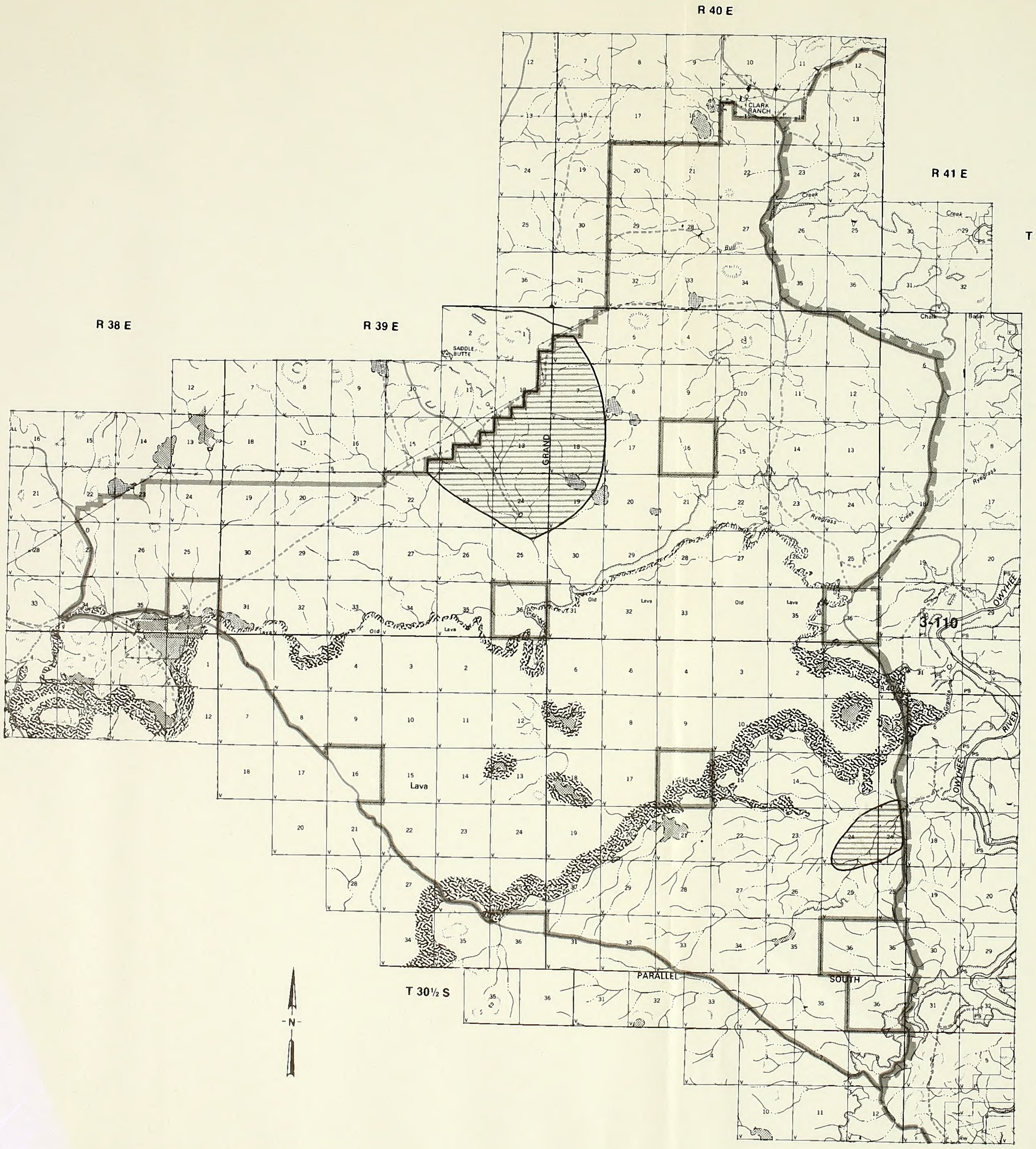
PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



Entire WSA:
Medium Potential
(3B) for Oil and Gas

▤ **Medium Potential**
(3B) for Gold and Molybdenum

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MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Saddle Butte WSA, OR-3-111. Southwestern portion of the WSA looking north across lava fields toward Saddle Butte. Within area recommended suitable under the partial alternative and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Saddle Butte WSA, OR-3-111. Southwestern portion of the WSA looking southeast showing a small playa surface. Within area recommended suitable under the partial alternative and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Bowden Hills Wilderness Study Area (OR-3-118)

General Description of Study Area

The Bowden Hills wilderness study area (WSA) is located along U.S. Highway 95, in Malheur County, approximately 36 miles north of McDermitt, Nevada (see map 1).

The WSA contains 56,140 acres of public land and 1,920 acres (three sections) of split estate (federally managed surface, state or privately owned subsurface mineral rights) (see map 2).

The WSA is roughly square in shape and is bordered mostly by BLM and Malheur County roads. U.S. Highway 95 forms about four miles of the southwestern boundary and fenced seedings border portions of the southern and southeastern edges. A dead-end road extends approximately five miles into the north-central portion of the WSA forming a part of the boundary. One-quarter mile of the northeastern tip of the WSA adjoins private lands of the Bowden Ranch and four parcels of split estate are scattered along the boundary. All other adjoining lands are public.

Topography in the WSA consists of low rolling hills, running north and south and associated benches and shallow valleys. A large flat area lies along the northwestern edge of the WSA. The eastern portion contains higher ridges and prominent rims. Surface water drains to the north, west and east via a number of small channels. No perennial streams or springs exist. Vegetation is largely typical sagebrush-bunchgrass.

Interrelationships

The rights-of-way for U.S. Highway 95 and for a power transmission line lie side by side along the southwestern WSA boundary. Portions of three Oregon State Highway Division material site rights-of-way fall inside the western boundary of the WSA.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- possible development of a powerline in a potential north-south utility corridor,

- potential mineral exploration and development,

- proposed development of a livestock reservoir and a wildlife guzzler (small wildlife watering device), and

- allocation of currently available but unallocated forage, resulting in an increase in livestock grazing.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- partial
- no wilderness/no action (preferred alternative)

An enhanced wilderness alternative, which would recommend acquisition of seven parcels of interior and adjacent split estate and closure of the dead-end road, is not analyzed since the effects would be similar to the partial alternative. That alternative analyzes acquisition of six of the seven parcels and closure of the dead-end road.

All Wilderness

Under the all wilderness alternative, all 56,140 acres would be recommended suitable as wilderness (see map 2). For purposes of analysis, it is assumed the split-estate inholdings would not be acquired and the dead-end road would remain open to vehicles.

Partial

The partial alternative would recommend 42,100 acres suitable as wilderness (see map 3).

The five-mile dead-end road would be closed. In addition, an attempt would be made to acquire six parcels of split estate totaling 3,160 acres. These parcels could be acquired through purchase or exchange with willing owners. Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 45,260 acres.

The western portion, totaling 17,800 acres, would be recommended nonsuitable as wilderness, which would provide for the potential utility corridor. The boundary on the west would follow legal subdivisions (section lines) from north to south in nearly a straight line, and the boundary on the east would change slightly to include part of a section of split-estate land out to the road (see map 3).

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development,
- restriction of vehicles to existing routes, and
- construction of a proposed livestock reservoir and wildlife guzzler.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageabilty of the Area as Wilderness

The areas that would be designated wilderness under both the all wilderness and partial alternatives would be manageable as wilderness.

Table 1. Summary of Proposed Management Under Each Alternative, Bowden Hills WSA (OR-3-118)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	56,140	42,100	0
Acres Closed to ORVs by Wilderness Designation	56,140	42,100	0
Miles of Roads Closed	0	5	0
Miles of Ways Closed	19	11	0
Acres of Split Estate Acquired [1]	0	3,160	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	56,140	42,100	0
Structural Wildlife Projects Developed: Catchments and Guzzlers (number)	0-1	0-1	1
Structural Livestock Projects Developed: Reservoirs and Waterholes (number)	0-1	0-1	1
Unallocated Existing Forage Allocated (AUMs)	0-1,834	0-1,834	1,834

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Bowden Hills WSA (OR-3-118)

Resource or Activity	All Wilderness	Partial	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 56,140 acres to the NWPS, including low, rolling sagebrush covered hills, rimrock providing raptor habitat, and relatively uncommon vegetative communities. Closure of 19 miles of ways would enhance wilderness values. If minerals were developed on split-estate inholdings, wilderness values would be adversely affected. The area would be manageable as wilderness.	Would add 45,260 acres to NWPS, assuming acquisition of 3,160 acres of split estate, and maintain wilderness characteristics. In nonsuitable portion, possible development of potential utility corridor or development of energy or mineral resources would adversely affect wilderness values. Closure of 11 miles of ways would enhance wilderness values. Area would be manageable as wilderness.	Possible adverse effects on wilderness characteristics if energy and mineral exploration or development occurs or ORV activity increases. Wilderness characteristics adversely affected in western portion if potential utility corridor developed.
Energy and Mineral Development	Development precluded on 56,140 acres, including 56,140 acres with moderate oil and gas potential, 1,300 acres with moderate geothermal potential and 1,770 acres with moderate gold potential.	Development precluded on 42,100 acres, plus an additional 3,160 acres if acquired. Includes 42,100 acres with moderate potential for oil and gas, and 1,770 acres with moderate potential for gold.	No impact.
Wildlife	Wildlife habitat preserved. If the guzzler and reservoir are not allowed, increase in range and numbers of game and nongame species could be foregone.	Same as all wilderness in suitable area. In nonsuitable area, possible development of potential utility corridor could have mixed but minor effects on wildlife.	Increase in range and numbers of game and non-game species realized from construction of the proposed guzzler and reservoir. Possible development of utility corridor could have mixed but minor effects on wildlife.
Livestock Grazing	No change in existing management. If proposed reservoir is not allowed, an opportunity to better distribute livestock and an increase of 170 AUMs in the allotment would be foregone. Allocatiom of 1,834 AUMs of available forage in pastures might be foregone.	Same as all wilderness.	No change in existing management. Better livestock distribution and an increase of 170 AUMs would be realized from construction of a reservoir. Additional 1,834 AUMs of available but unallocated forage in pastures could be allocated.
Utility Corridor Routing	Potential utility corridor could not be located in the WSA. Would add negligible length.	Allows location of utility corridor as proposed.	Same as partial.
Recreation Use	Shift from vehicle-oriented to primitive recreation. Slight increase in hunting use if wildlife guzzler and reservoir allowed. No substantial net change in overall recreation use.	Same as all wilderness.	Slight increase in hunting use if wildlife guzzler and reservoir allowed. Overall, no significant change in recreation use.
Economic Value and Local Income	Increase in economic value and local personal income by $14,744 and $32,303, respectively, if proposed structural projects were allowed and if the full adjustment to use available but unallocated forage were allowed. There would be no change in economic value or local personal income if projects were not allowed and if livestock use of available but unallocated forage were not allowed.	Same as all wilderness.	Increase in economic value and local personal income by $14,744 and $32,303, respectively, from construction of proposed structural projects, and from adjustments to use currently available but unallocated livestock forage.

The split-estate parcels could cause manageability problems if they were developed.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action is preferred because the benefits of retaining options for development in the area -- including exploration for and development of potential energy and mineral resources, construction of energy transmission facilities in a potential utility corridor, and construction of livestock and wildlife management facilities -- would outweigh the benefits of preserving the area's limited number of wilderness values.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Bowden Hills WSA remains in a highly natural condition. Much of the eastern edge and the center of the study area are devoid of signs of human activity.

Thirteen man-made features in the WSA affect the area's naturalness. They include 8 ways (vehicle routes established and maintained solely by the passage of vehicles) totaling 19 miles, 4 small livestock reservoirs, and 5 miles of barbed wire fence. These man-made features are concentrated in the area's southwestern corner and influence approximately 14 percent of the WSA. (The area of influence is an estimate of the acreage from which these man-made features can be seen.)

Exterior features consist of boundary roads, the dead-end road, numerous livestock grazing developments, and the buildings and associated developments at the Bowden Ranch, just outside the northeastern corner of the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The large size and square configuration of the Bowden Hills WSA provides outstanding opportunities for solitude. Topographic screening is good except on the relatively flat area along the western edge. Little screening is provided by the area's low vegetation. Visitors can easily find a secluded spot in the rolling terrain. There are no special features where visitors might concentrate. Traffic on U.S. Highway 95 detracts from the opportunities for solitude along much of the WSA's western edge. Other activities occurring sporadically at the Bowden Ranch also disturb solitude; these activities only affect the extreme northeast corner of the WSA.

The WSA provides opportunities for hunting, sightseeing, horseback riding, day hiking, backpacking, camping, birdwatching and photography. None of these opportunities is outstanding.

Special Features

Extensive areas of black sagebrush in the northern portion of the study area, and large patches of sand dropseed along south-facing hillsides near the Whitehorse Road Junction with U.S. Highway 95, are dependent upon unusual combinations of soils and exposure found in few locations in southeastern Oregon, These vegetative types are of some interest to soil scientists, botanists and ecologists.

The WSA lies within the range of the kit fox, which is on the Oregon Department of Fish and Wildlife's (ODFW) list of threatened species. Rimrock areas in the eastern portion of the WSA provide nesting sites for golden eagles and several species of hawks.

Diversity in the National Wilderness Preservation System (NWPS)

The WSA lies in the Intermountain Sagebrush Province and the potential natural vegetation is sagebrush steppe and saltbush/greasewood, according to the Bailey-Küchler method of classifying ecosystems. Of the plant communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, the WSA contains the big sagebrush/bluebunch wheatgrass, low sagebrush/bluebunch wheatgrass, and shadscale/Indian ricegrass communities.

Boise, Idaho, is the only standard metropolitan statistical area with population over 100,000 located within 5 hours' driving time of the study area.

Energy and Mineral Development

Energy and mineral resources of the Bowden Hills WSA were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediments sampling by a BLM geologist. Technical details of the findings of the evaluation are in a BLM report titled "Assessment of Geology, Energy, Mineral (GEM) Resources of Bowden Hills Geologic Resource Area (GRA)".

The WSA is within the Bowden Hills geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Oil and gas is rated moderately favorable for occurrence throughout the entire WSA. Geothermal resources and gold and molybdenum are rated moderately favorable for occurrence in portions of the WSA.

The mineral potential classifications for the WSA are shown in table 3. Map 4 shows the areas which have been rated moderate (medium) for gold and geothermal resources.

Oil and gas and geothermal are the main potential energy resources in the study area. Oil and gas potential will largely depend on the presence or absence of suitable marine rocks at depth. An oil and gas exploratory well was drilled about 20 miles to the southwest; oil or gas was not discovered, however.

Because of youthful volcanism and above-normal heat flow, most of eastern Oregon is generally considered favorable for thermal waters for direct-use heat application. Smaller areas are favorable for high-temperature geothermal resources.

Numerous faults are present along the eastern and southern half of the study area. Steeply dipping faults are of particular importance for the development of conduits for hydrothermal systems and low-temperature mineralizing fluids. Therefore, the most favorable sites for deposition would probably be in the vein deposits or fracture fillings associated with faulting in the area.

Table 3. Classification of Energy and Mineral Potential, Bowden Hills WSA (OR-3-118)

Commodity	Area	Classification Level	Confidence Level
Metals			
Gold	See map 4	3	B
Gold, silver, mercury	Rest of WSA	2	B
Geothermal	See map 4	3	C
	Rest of WSA	2	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	B
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	2	A
Diatomite	Entire WSA	1	B
Zeolites	Entire WSA	2	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

The resource potential for these geologic units is considered to be low to moderate, due in part to the general character of these deposits. However, localized economically significant low-temperature deposits of gold, silver and mercury can be associated with such geologic units.

There were no geothermal or oil and gas leases and no mining claims in the study area as of January 1, 1984.

The rocks exposed in the Bowden Hills WSA are Tertiary and Quaternary. The Tertiary rocks consist of basalt and andesite flows. Locally these rocks contain flow breccia, minor silicic ash-flow tuffs, interbeds of tuffaceous sedimentary rocks and fluvial deposits of tuff (lesser amounts of siltstone, sandstone and pebble). Silicic flows are commonly crystalized and altered to clay minerals. The Tertiary rocks also contain some welded and non-welded ash-flow tuffs and minor rhyolite flows. Quaternary deposits in the study area consist of unconsolidated deposits of gravel, cobbles, and boulders with intermixed and locally interlayered clay, silt and sand.

Vegetation

Most of the WSA is composed of three plant communities, each of which comprise a little less than a third of the area within the WSA: Wyoming big sagebrush/ bluebunch wheatgrass, black sagebrush/bluebunch wheatgrass, and shadscale/ Indian ricegrass. The remainder of the area is divided between the black sagebrush/squirreltail community and the low sagebrush/Sandberg's bluegrass community. In general, the WSA is transitional between a typical sagebrush-steppe vegetation zone (dominated by big sagebrush and bluebunch wheatgrass) and a high desert vegetation zone (dominated by shadscale and Indian ricegrass).

Black sagebrush is interspersed in areas with highly calcareous soil. The vegetation is relatively undisturbed and is in late-seral and mid-seral stage. (Seral refers to the stage of ecological condition based on the difference between the present plant community and climax vegetation, which is the relatively stable, final stage in plant succession.)

Species such as sand dropseed and black sagebrush found here are relatively uncommon.

Wildlife

Antelope winter in areas dominated by low structured vegetation, especially black sagebrush. Mule deer winter within the more rugged breaks of the Bowden Hills, depending on the severity of the winter. It appears that winters of deep snow accumulation cause greater use of this range. The kit fox, an ODFW threatened species, may occur sparingly within the study area due to the similarity of the area's vegetative types to areas they are known to use. Golden eagles and several species of hawks nest on the rims of the Bowden Hills.

A wildlife guzzler is proposed near the center of the WSA. The development is designed to provide a water source for the area's game and nongame wildlife species.

Livestock Grazing

Portions of two grazing allotments are within the WSA. Table 4 summarizes existing and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and calf, or equivalent animals, for one month).

Existing livestock developments in the WSA (among the man-made features listed in the Naturalness section) include 4 small stock reservoirs and 5 miles of fence.

One new reservoir is proposed within the WSA, which would better distribute livestock and increase forage availability as well as licensed use within the allotment by 170 AUMs. The reservoir would be located near the dead-end road in the north-central portion of the WSA.

Licensed livestock grazing in pastures wholly or partially in the WSA is proposed to be increased by 1,834 AUMs by allocating available forage. Increases in the WSA would vary according to the amount of pasture in the WSA and other factors such as terrain and vegetation.

Most of the motor vehicle use for livestock management in this area is along the boundary roads and the interior dead-end road. Except for occasional use of ways for water hauling and livestock gathering, most of the livestock management operations can be handled on horseback.

Utility Corridor Routing

The Bonneville Power Administration (BPA) has under long-term consideration construction of a 500-kV power transmission line through a potential north-south corridor which would cross the western edge of the Bowden Hills WSA.

Recreation Use

Occasional hunting for deer, antelope and chukar occurs in the study area. However, game populations are small compared with nearby areas, and hunting pressure is light. Vehicle use is also light due to a lack of either attractive features or activities, and the lack of vehicle routes.

Table 4. Existing and Potential Livestock Use, Bowden Hills WSA (OR-3-118)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]	Available but Unallocated Forage in Pastures (AUMs)
Barren Valley Common (No. 0801)	10,237	01/17-03/31	12	1,068	170	1,834
Fifteenmile Community (No. 1201)	25,118	03/01-04/15	2	97	0	0
Totals	35,355			1,165	170	1,834

[1] Increases might or might not result in increased licensed use in the allotment (see narrative).

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 1,165 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $8,784 annually, and local personal income generated by existing outputs amounts to $18,733 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affested by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 56,140 acres to the National Wilderness Preservation System (NWPS) and would maintain the wilderness characteristics of the area. An area of low, rolling, sagebrush-covered hills, rimrock providing raptor habitat, and vegetative communities that are relatively uncommon in southeastern Oregon would be preserved.

Approximately 19 miles of ways would be closed and would eventually revegetate. Naturalness would be enhanced and opportunities for solitude and primitive recreation would improve with the reduction of vehicle disturbances. If minerals were developed on the split-estate inholdings, the area's naturalness and opportunities for solitude and primitive recreation would be adversely affected.

The **partial alternative** would add 45,260 acres to the NWPS, assuming the 3,160 acres of split estate could be acquired. Some 11 miles of ways would be closed and would revegetate. The area recommended suitable would be affected in the same manner as under the all wilderness alternative. In addition, closing the 5-mile dead-end road would further enhance naturalness and opportunities for solitude and primitive recreation. If the six parcels of split estate were acquired, the possibility of mineral development on these parcels would be eliminated.

The area recommended nonsuitable as wilderness would continue to be influenced by vehicles travelling on 8 miles of ways. Mineral and energy development could occur on the nonsuitable portion. Opportunities for solitude would be reduced during development operations, naturalness would be affected by developments, and opportunities for primitive recreation would decrease.

Both the partial and the no wilderness/no action alternatives would allow development of the potential utility corridor in the western portion of the WSA, which could affect wilderness values in much of the western edge of the WSA. Opportunities for solitude would be adversely affected during construction, and naturalness would be affected indefinitely. Primitive recreation opportunities would diminish as the project's access routes opened more of the WSA to motor vehicles.

Under the **no wilderness/no action alternative**, the entire WSA would be subject to impacts on naturalness and opportunities for solitude and primitive recreation from potential mining and energy development. Localized impacts to vegetative special features could occur.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Acres of land that would be withdrawn, including acres that have been classified as having a moderate potential for occurrence of geothermal resources and gold and molybdenum, are shown in table 5.

Table 5. Effects of Alternatives on Energy and Mineral Development, Bowden Hills WSA (OR-3-118)

	Acres Withdrawn		
	All Wilderness	Partial	No Wilderness/ No Action
Total acres	56,140	42,100 [1]	0
Geothermal rated moderate	1,300	0	0
Oil and Gas rated moderate	56,140	42,100	0
Gold rated moderate	1,770	1,770 [2]	0

[1] Development would be precluded on an additional 3,160 acres if split-estate is acquired, as proposed under this alternative.
[2] Small portion in northwest corner of rated area would not be withdrawn under this alternative (in portion recommended nonsuitable).

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under the **all wilderness and partial alternatives**, the proposed guzzler, as well as the proposed reservoir for livestock, might or might not be allowed, depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If not allowed, an opportunity to increase range and numbers of game and nongame species would be foregone.

Under the partial alternative, possible development of the potential utility corridor along the western portion of the Bowden Hills study area would have mixed, but minor, impacts to wildlife. Raptor species might benefit modestly through the creation of additional nesting and perching sites. Conversely, antelope, mule deer and kit fox could lose a minor amount of habitat through vegetative disruptions caused by artificial structures and human presence.

Under the **no wilderness/no action alternative**, little effect on wildlife is foreseen. Development of additional water sources for livestock and wildlife (reservoir and guzzler) would increase range and numbers of game and nongame species of wildlife. Drinking water is now a limiting factor within much of the habitat of the study area. Possible development of the potential utility corridor would have the same effects as under the partial alternative.

Effects on Livestock Grazing

Under the **all wilderness and partial alternatives**, the proposed reservoir might or might not be allowed, depending upon a site-specific assessment of whether it conforms with Wilderness Management Policy. If not allowed, a potential increase of 170 AUMs in the allotment and the opportunity to better distribute livestock would be foregone.

The project has a benefit/cost ratio of greater than 1:1.

Restrictions on vehicle or heavy equipment use under the all wilderness alternative would not hinder livestock management because there currently is little dependence on vehicle use.

Since increases in licensed use through allocation of available forage might not be allowed under Wilderness Management Policy, all increases in pastures partially in areas recommended suitable might be foregone. Thus, increases foregone within these pastures would range from 0 to 1,834 AUMs under the all wilderness and partial alternatives.

Impacts to livestock grazing under the partial alternative would be the same as those under the all wilderness alternative, except that closing the dead-end road could complicate livestock management; the road may be needed to haul water if the existing reservoir does not completely satisfy this need.

The proposed reservoir would be allowed under the **no wilderness/no action alternative**, providing better livestock distribution and an estimated 170 AUMs in additional livestock forage in the allotment. The 1,834 AUMs of unallocated forage throughout the pastures would also be allocated.

Effects on Utility Corridor Routing

Under the all wilderness alternative, the potential north-south utility corridor could not be located in the WSA. Location of the corridor to the west, outside the WSA, would add negligible length to it.

Under the partial and no wilderness/no action alternatives, the utility corridor could be located as proposed.

Effects on Recreation Use

Little net change in overall recreation use is expected under any of the alternatives.

Under the **all wilderness and partial alternatives**, hunting use would increase slightly should the reservoir and wildlife guzzler be allowed. This increase would be realized under the **no wilderness/no action alternative**.

Closing of the ways under the all wilderness alternative, closing of the ways and dead-end road under the partial alternative, or leaving these routes open under the no wilderness/no action alternative would all result in little change in recreation use. Overall recreation use is expected to remain light with only a slight shift under the all wilderness and partial alternatives to primitive types of recreation.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the reservoir and guzzler proposed for this WSA, would be constructed if the area were designated wilderness; nor is it known if the grazing increases would be allowed.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements and/or grazing adjustments were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The **all wilderness, and partial wilderness alternatives** would restrict such vehicle use unless there is no practical alternative. There would be no impact and no increase in costs to the grazing operator from road closures in the WSA.

Table 6. Effects of Alternatives on Annual Economic Value, Bowden Hills WSA (OR-3-118) (1981 price levels)

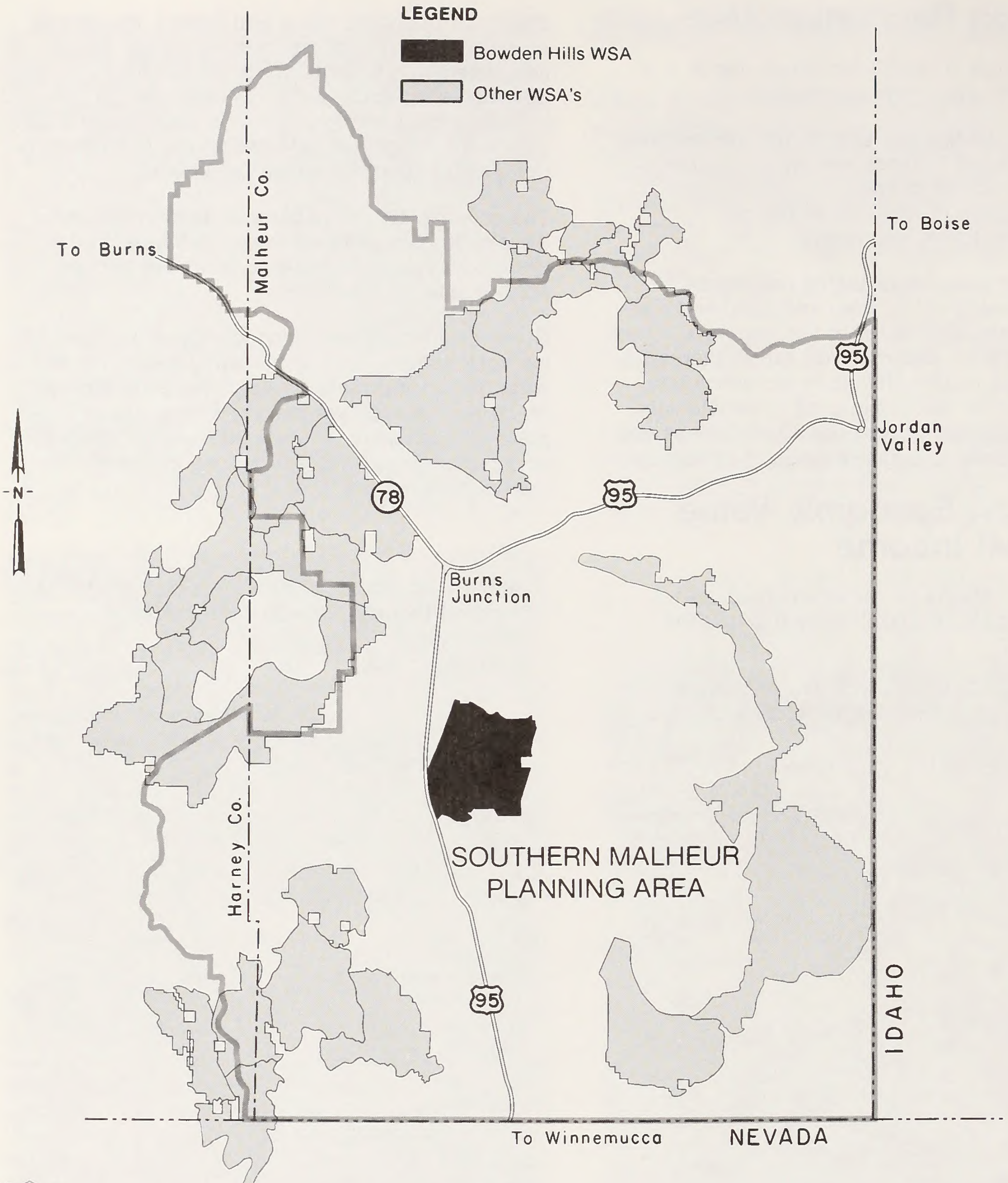
Item	Unit of Measure	All Wilderness, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +1,834	+1,834
Investment [2]	AUM	0 to +170	+170
Big game hunting [3]	RVD	0 to +3	+3
Upland game hunting [3]	RVD	0 to +4	+4
VALUE OF PLANNED INVESTMENTS [4]			
Grazing	$	0 to +1,282	+1,282
Big game hunting	$	0 to +86	+86
Upland game hunting	$	0 to +125	+125
Total [5]	$	0 to +1,493	+1,493
Investments [6]	$	0 to -577	-577
Net Economic Value	$	0 to +916	+916
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustments	$	0 to +13,828	+13,828
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	0 to +14,744	+14,744

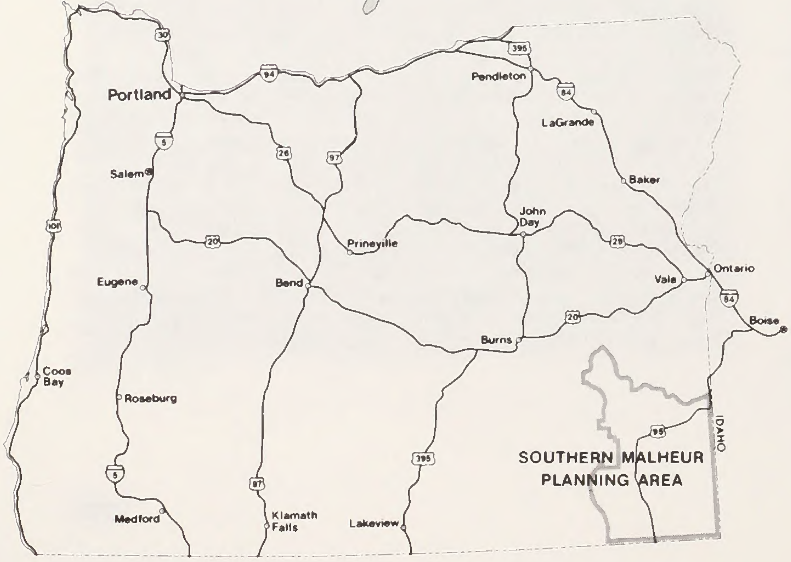
[1] Adjustments to use currently available but unallocated livestock forage.
[2] Expected future increases due to range improvement investments.
[3] Expected future increases from proposed wildlife and livestock projects.
[4] Structural projects involving up to $6,800 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[5] Detail may not sum to "Total" due to rounding.
[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

Table 7. Effects of Alternatives on Local Personal Income, Bowden Hills WSA (OR-3-118) (1981 price levels)

Item	Unit of Measure	All Wilderness, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +1,834	+1,834
Investment [2]	AUM	0 to +170	+170
Big game hunting [3]	RVD	0 to +3	+3
Upland game hunting [3]	RVD	0 to +4	+4
INCOME FROM PROPOSED INVESTMENTS [4]			
MGrazing	$	0 to +2,734	+2,734
Big game hunting	$	0 to +25	+25
Upland game hunting	$	0 to +53	+53
Construction activity [5]	$	0 to +936	+936
Total [6]	$	0 to +2,812	+2,812
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustments	$	0 to +29,491	+29,491
INCOME FROM ALL OUTPUT CHANGES			
All categories [6]	$	0 to +32,303	+32,303

[1] Adjustments to utilize currently available but unallocated livestock forage.
[2] Expected future increases due to range improvement investments.
[3] Expected future increases from proposed wildlife and structural projects.
[4] Structural projects involving up to $6,800 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.
[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.





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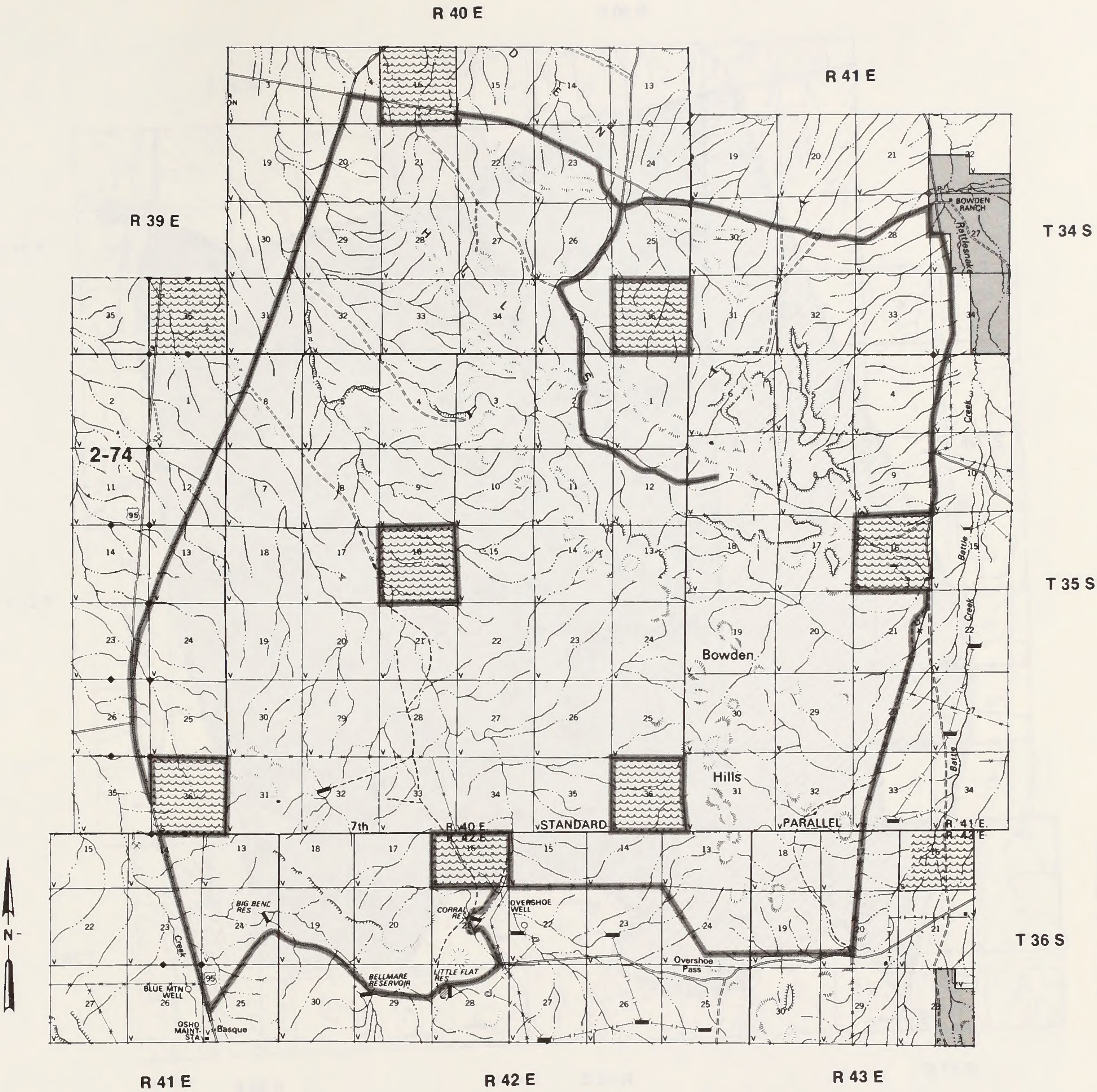
Vale District

Bowden Hills WSA
OR-3-118

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

■ Private

▨ BLM Surface-State or Private Subsurface (Split Estate)

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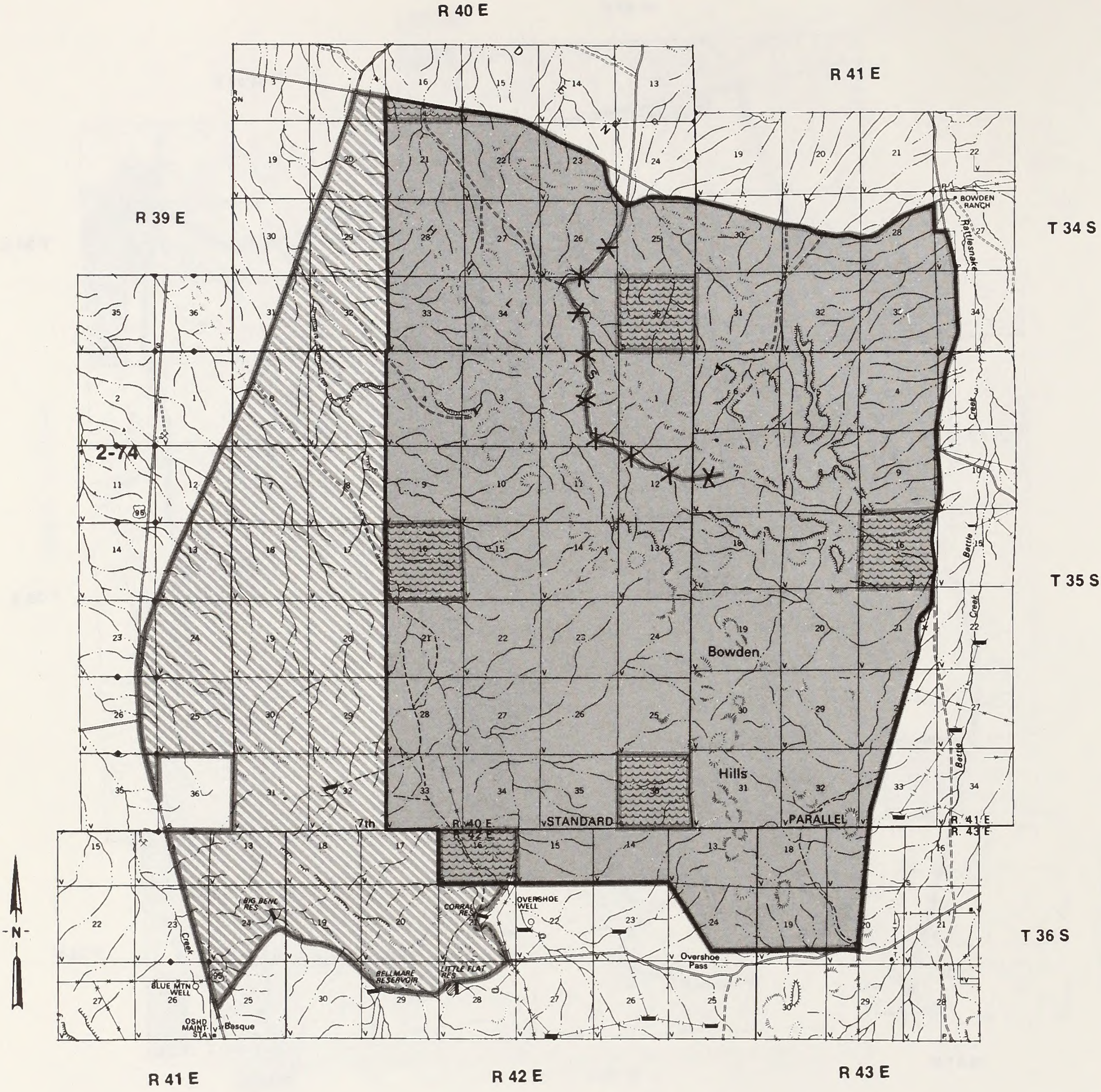
Bowden Hills WSA
OR-3-118

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



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Bowden Hills WSA
OR-3-118

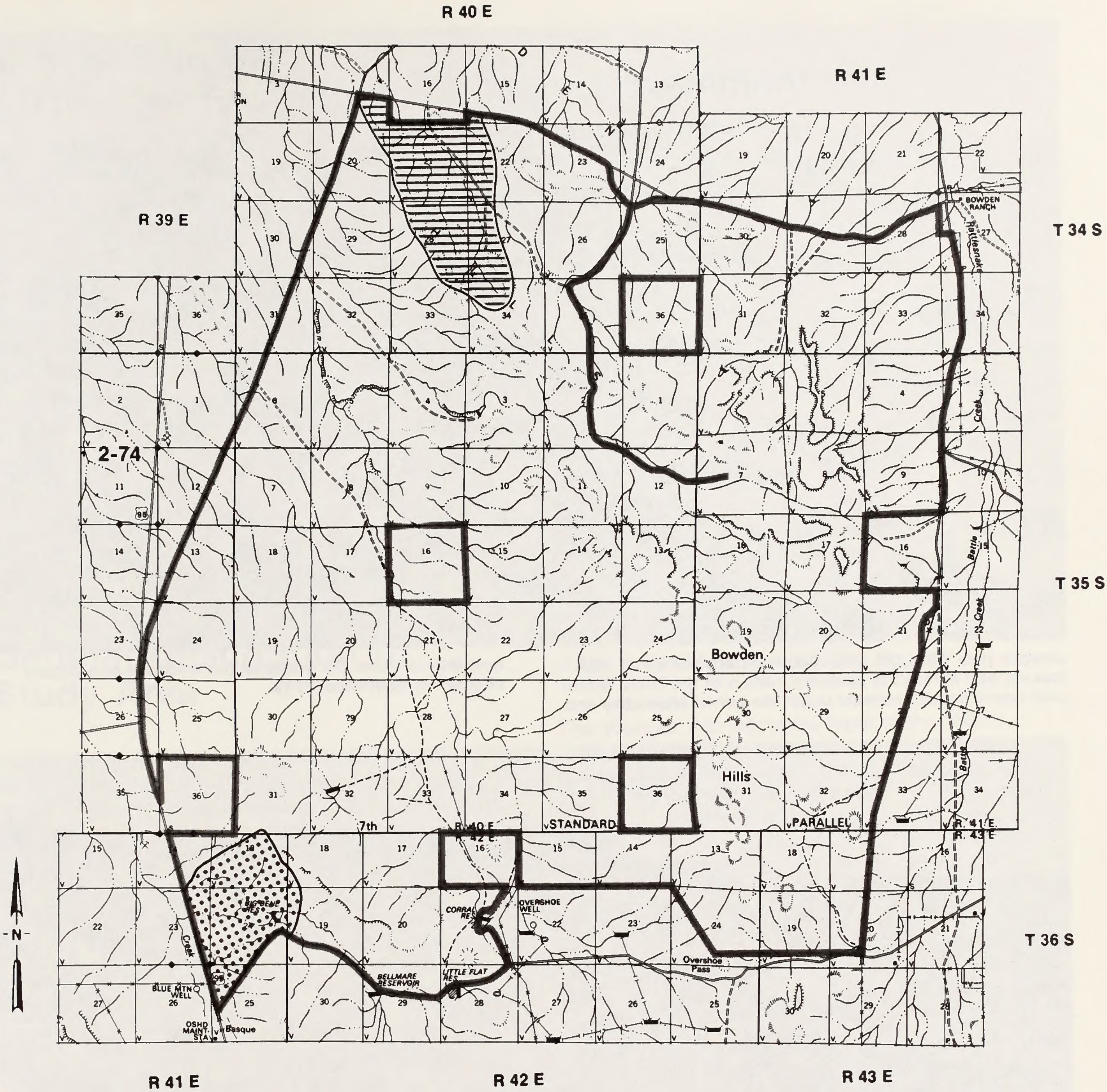
PARTIAL ALTERNATIVE

1 0 1 2 MILES

LEGEND

- ▬ Wilderness Study Area Boundary
- ■ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- ✕—✕ Recommended Road Closure

MAP 3



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Vale District

Entire WSA:
Medium Potential
(3B) for Oil and Gas

Bowden Hills WSA
OR-3-118

▤ **Medium Potential**
(3B) for Gold

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

░ **Medium Potential**
(3C) for Geothermal Resources

MAP 4

Bowden Hills WSA, OR-3-118. Southwestern portion of WSA looking east across the southern portion of the WSA. Within area recommended suitable under the partial alternative and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Bowden Hills WSA, OR-3-118. Northeastern portion of WSA looking west up a main drainage. Within area recommended suitable under the partial alternative and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Clarks Butte Wilderness Study Area (OR-3-120)

General Description of Study Area

The Clarks Butte wilderness study area (WSA) is located in Malheur County, Oregon, approximately 18 miles west of Jordan Valley and 6 miles north of U.S. Highway 95 (see map 1).

The WSA contains 31,450 acres, all of it public land (see map 2). It is bordered on the north by a BLM road, on the east and south by private land, and on the west by BLM roads and fenced areas of public land containing extensive vegetative land treatments (crested wheatgrass seeding). A 1/2-mile-long dead-end road enters the WSA, forming part of the boundary, and provides access to Junction Pit Reservoir from the western boundary road.

While there are no private inholdings in the WSA, two 40-acre private parcels are nearly enclosed by the boundary. One parcel is adjacent to the western boundary, and the other is on the eastern boundary.

Clarks Butte gently rises approximately one mile north of the study area's center. About one mile south from the same point lies Lava Butte.

The WSA contains two distinct lava flows. The older flow generally has weathered to a relatively smooth soil mantle and occupies the northern third of the WSA. It includes Clarks Butte, the probable source of the flow, and the surrounding slopes.

The younger flow occupies most of the WSA's southern two-thirds. It consists of two probable sources (Lava Butte and unnamed companion butte) and the surrounding, gently sloping circular outflow. The surface features are much more distinct here than on the older Clarks Butte flow. Craters, spatter cones, lava tubes, caves, domes, and gutters are still recognizable even though some weathering and soil deposition have occurred.

Vegetation in the WSA is predominantly a Wyoming big sagebrush-bluebunch wheatgrass community. Much of this vegetation in the Lava Butte flow is relatively pristine because livestock grazing is limited by the area's lack of water and its broken surface.

Interrelationships

The northern portion of the WSA includes a small portion (3,270 acres) of the Jordan Craters Research Natural Area (RNA) and a larger portion (8,710 acres) of the Jordan Craters Area of Critical Environmental Concern (ACEC) (see map 3). The RNA was designated in 1975 to protect unique ecological, geological and biological features for scientific and educational endeavors. The ACEC was designated in 1983 to provide special management to protect these features. Special management for the ACEC includes:

- limiting ORV (off-road vehicle) use to designated roads and trails;

- erecting barriers and signs to deter ORV use and protect the fragile habitat;

- continuing river patrols during high use to monitor and prevent over use which may damage the sensitive values; and

- conducting studies of river carrying capacity and then regulating river use to prevent damage to sensitive plants, fish and wildlife habitat.

These restrictions for the ACEC would continue to apply for the portion within the study area whether or not the area is designated wilderness.

This study area is adjacent to the Jordan Craters WSA (OR-3-128) directly to the north and is separated from it by a road.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- possible construction of a power transmission line in a potential utility corridor, and effects on waterfowl (Construction of powerlines across the WSA or anywhere in the flyway between the fields and pastures along Jordan Creek south of the WSA and the Cow Lakes and Batch Lakes wetlands north of the WSA would create a hazard for waterfowl. During foggy conditions and at night, waterfowl could be killed by collisions with powerlines. These effects could occur under any alternative and, thus, are not analyzed further in this document. The powerlines would not present a hazard to waterfowl using the Cow Lakes-Batch Lakes wetlands if they were constructed in the southern part of the proposed corridor, south of the irrigated fields and pastures along Jordan Creek.),

- possible development of existing and potential mineral rights,

- proposed construction of several livestock and wildlife projects, and

- possible increased visitor use due to wilderness designation, particularly effects on the area's unique and fragile lava features.

Also raised as an issue was the possibility of combining the Jordan Craters WSA with the Clarks Butte WSA into a single wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- partial
- no wilderness/no action (preferred alternative)

An enhanced wilderness alternative, which would combine this WSA with the Jordan Craters WSA by closing the road between them, is not analyzed. The road is one of the access routes from the populated Jordan Valley area to the more remote Mud Lake area. It is used by crews who maintain numerous range projects throughout the Mud Lake area, and closing this road would cause a 15- to 30-mile detour.

All Wilderness

The all wilderness alternative would recommend all 31,450 acres in the WSA suitable as wilderness (see map 2). The short dead-end road to Junction Pit Reservoir would remain open.

Partial

The partial alternative would recommend 18,250 acres suitable as wilderness (see map 4). This would include all of the younger lava flow in the southern two-thirds of the WSA. Approximately 13,200 acres would be recommended nonsuitable. This would include all of the older lava flow in the northern third of the WSA. The boundary separating the suitable and nonsuitable areas would be the easily identifiable edge between the two lava flows. The short dead-end road to Junction Pit Reservoir would remain open.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features, in addition to ACEC constraints, relevant to this analysis:

- construction of proposed livestock and wildlife projects, including a small reservoir, four guzzlers (small wildlife watering devices), and burning of 6,450 acres for brush control;
- restriction of vehicles to existing routes outside the ACEC; and
- continued availability for mineral exploration and development, but with no-surface-occupancy restrictions on leases and closure of the RNA/ACEC portion of the WSA to salable mineral development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Table 1. Summary of Proposed Management Under Each Alternative, Clarks Butte WSA (OR-3-120)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	31,450	18,250	0
Acres Closed to ORVs by Wilderness Designation	31,450	18,250	0
Miles of Ways Closed	1	1	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	31,450	18,250	0
Structural Wildlife Projects Developed: Catchments and Guzzlers (number)	0-4	0-4	4
Vegetative Manipulation for Livestock: Brush Control Without Seeding (acres)	0	6,450	6,450
Structural Livestock Projects Developed: Reservoirs and Waterholes (number)	0-1	1	1
Unallocated Existing Forage Allocated (AUMs)	0-998	0-998	998

Manageability of the Area as Wilderness

Because the WSA is entirely public land, of a relatively large size and concentrated configuration, and has a high degree of naturalness and difficult, uninviting terrain, it would be easily manageable as wilderness. If the area were designated wilderness, there would be little or no increase in recreation use due to the limited nature and quality of the recreational activities available in the WSA. If recreation use did increase, it might have to be controlled to prevent damage to the area's fragile physical features and ecological systems.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of preserving the area's limited wilderness values is outweighed by retaining opportunities to increase livestock forage, increase wildlife populations, and explore for oil and gas and geothermal resources. The area is rated as having a moderate potential for both energy sources.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Clarks Butte WSA is in a highly natural condition. The lava flows which occupy most of the surface of the WSA are generally free of man-made developments. There are four man-made developments, including a fence, 2 reservoirs, a one-mile way, and an irrigation canal within the WSA. The fence, reservoir and canal lie between Clarks Butte and the eastern boundary. The other reservoir is in the northwest corner. These developments influence about 3 percent of the study area. (The area of influence is an estimate of the acreage within the WSA from which these man-made developments can be seen.) The southeastern slopes are influenced slightly by distant outside man-made developments.

Table 2. Summary of Environmental Consequences of Alternatives, Clarks Butte WSA (OR-3-120)

Resource or Activity	All Wilderness	Partial	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 31,450 acres to NWPS. Maintain wilderness characteristics of highly natural area and special lava features. Revegetation of one-mile way would add to naturalness. Entire area would be manageable as wilderness.	Would add 18,250 acres to the NWPS and preserve the wilderness values associated with the lava field. Revegetation of one-mile way would add to naturalness. Wilderness values on 13,200 acres recommended as nonsuitable for wilderness could be adversely affected by proposed brush control project (burn) and potential mineral exploration and development. Area recommended suitable would be manageable as wilderness.	Naturalness reduced by possible powerline construction, and proposed livestock and wildlife projects. Potential for loss of special features (geologic features in lava flow) on construction sites. Solitude adversely affected as access and activities increase.
Energy and Mineral Development	Development precluded on 31,450 acres, including 31,450 acres with moderate potential for geothermal resources and oil and gas.	Development precluded on 18,250 acres including 18,250 acres with moderate potential for oil and gas and geothermal resources.	No impact.
Vegetation	Vegetation preserved.	Vegetation preserved in suitable area. In nonsuitable area, there would be a decrease in composition of brush on 6,450 acres proposed for burning, which would reduce vegetation diversity and increase grass density.	Possible loss of unique vegetative habitats on lava from possible powerline construction. Effects of proposed burn same as partial alternative.
Wildlife	Wildlife habitat preserved. If proposed guzzlers are not allowed, opportunity to increase mule deer and upland game populations would be foregone.	Wildlife habitat preserved in suitable portion. Impact of guzzlers same as all wilderness alternative. Due to brush control, net loss in population of deer and brush-dependent nongame species.	Proposed guzzlers would allow an increase in upland game birds. Proposed brush control would have same impact as partial alternative.
Livestock Grazing	Increase of 50 AUMs and better distribution of livestock could be foregone if construction of reservoir is not allowed. 840 AUMs associated with burn would be foregone. Allocation of 998 AUMs of available forage in pastures might be foregone.	Increase in licensed livestock use of 890 AUMs and better distribution of livestock as a result of implementing the proposed brush control and reservoir. Increase in pastures of 998 AUMs from allocation of existing forage might be foregone.	Increase in licensed livestock use of 890 AUMs realized as a result of implementing the proposed brush control and reservoir. Increase in pastures of 998 AUMs realized from allocation of existing forage.
Utility Corridor Routing	Proposed utility corridor would be located outside WSA.	Transmission line could be built within the proposed corridor across the WSA.	Same as partial.
Recreation Use	Slight increase in spelunking, and possible increase in hunting if guzzlers are installed. Overall, recreation use would not change substantially.	Same as all wilderness, except that spelunking may decrease if powerline construction damages caves.	Slight increase in hunting due to installation of guzzlers. Spelunking could decrease if powerline construction damages caves. Overall, recreation use would not change.
Economic Value and Local Income	Changes in annual economic value could be a decrease of as much as $26 or an increase of as much as $7,505, depending on what proposed projects and grazing increases would be allowed in wilderness. Effects on local personal income would range from no change to an increase of as much as $17,161, depending on the same uncertain factors. Excludes unknown economic effects of mineral development and unquantified changes in recreation use. The maximum increase in transportation costs to livestock operators would be $20.	Increase in annual economic value could range from as little as $4,488 to as much as $12,396 depending on what proposed projects and grazing increases would be allowed in wilderness. Local personal income would increase by $14,311 to $30,668, depending on the same uncertain factors. Excludes unknown economic effects of mineral development and unquantified changes in recreation use. The maximum increase in transportation costs to livestock operators would be $20.	Increase in economic value and local personal income by $12,033 and $30,668, respectively, from construction of all proposed projects, and from adjustments to use currently available but unallocated livestock forage.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The Clarks Butte WSA offers outstanding opportunities for solitude, which are enhanced by the area's size and configuration. However, the area's relatively unpronounced topographic relief and low vegetation do not provide many secluded spots. On the buttes, which are an attraction because they provide a commanding view of the WSA, visitors will readily observe and be observed by others on the buttes or plains below. A short, southerly extension of the area is too narrow to provide isolation from activities outside the WSA.

Sights and sounds from activities outside the WSA include vehicle travel on the northern and eastern boundary roads, ranching activities to the east, maintenance of livestock water projects to the west and military aircraft training flights overhead. These intrusions are generally brief and distant, and their impacts do not substantially affect the WSA.

Spelunking is the only notable recreation opportunity available in the WSA. Other primitive recreation opportunities are limited by the lack of distinguishing features.

Special Features

The two different lava flows in the Clarks Butte WSA, in conjunction with a younger flow in the adjacent Jordan Craters WSA, exhibit three stages in the aging and weathering of volcanic features. A series of deep cracks runs for about a mile inside the Clarks Butte flow near its interface with the Lava Butte flow. The cracks parallel the interface and indicate a possible failure in the older crust from the weight of the encroaching younger lava.

A small area of very recent, textured lava is located within the Lava Butte flow. The texture, color, and possibly the chemical composition of the extrusion differ from the more common pahoehoe flows.

The Lava Butte flow includes at least one system of lava tubes which contains some uncollapsed cave segments. Collapsed tubes and other fissure areas provide uniquely stable temperatures and humidities which promote the growth of mosses and ferns not normally found in the harsh, dry climate of the region.

The scientific and educational importance of the WSA is indicated by the results of previous scientific studies and by the fact that it includes part of the Jordan Craters RNA and ACEC. This portion contains outstanding scenic qualities.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and its potential natural vegetation is sagebrush steppe. Of the plant communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, the WSA represents a big sagebrush/bluebunch wheatgrass community.

Boise, Idaho is the only standard metropolitan statistical area with a population over 100,000 located within 5 hours' driving time of the study area.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data by BLM geologists. Technical details of the findings of the findings of the evaluation are in a BLM report titled "Assessment of Geology, Energy and Mineral Resources of Jordan Craters-Clarks Butte Geologic Resource Area".

The WSA is within the Jordan Craters-Clarks Butte geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire Clarks Butte WSA is moderately favorable for geothermal heat and oil and gas.

Table 3 shows the mineral potential classifications in the WSA.

Oil and gas and geothermal heat are the main potential energy sources in the Clarks Butte WSA. Because of youthful volcanism, the study area may have thermal water for direct use as a source of heat. Oil and gas potential largely depends on the presence or absence of suitable marine rocks at the subsurface. There has been no drilling in the vicinity which has penetrated the Tertiary volcanic cover.

As of January 1, 1984 there were no oil and gas or geothermal leases and no mining claims in the WSA.

The rocks exposed in the Clarks Butte WSA are mostly volcanic, predominantly basalt, rhyolite, and welded ash flow tuffs. These rocks are underlain by a thick accumulation of Tertiary volcanic and some sedimentary rocks.

Table 3. Classification of Energy and Mineral Potential, Clarks Butte WSA (OR-3-120)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, silver mercury)	Entire WSA	2	B
Geothermal	Entire WSA	3	B
Uranium/Thorium	Entire WSA	1	B
Coal	Entire WSA	1	C
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	B
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	1	B
Diatomite	Entire WSA	1	B
Zeolites	Entire WSA	1	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Vegetation

The area is divided into two similar vegetative communities, both dominated by Wyoming big sagebrush and bluebunch wheatgrass. One community lies outside the lava flow in the northern portion of the WSA. It is in mid-seral stage. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The other plant community lies within the Lava Butte lava flow.

Because of the difficulty of the terrain, and lack of water and forage, the flow is basically ungrazed. Areas of lava and rocks are interspersed with areas with soil and vegetation. As a whole, it is in early-seral stage due to the rocky surface. However, in the isolated pockets where soil has developed and matured, the vegetative composition is near climax.

Scattered fissures and collapsed lava tubes within the lava flow provide unique vegetative habitats. They support fern species such as Eaton hollyfern and male woodfern which are uncommon in this location.

Wildlife

Wildlife is not abundant in the WSA due to the scarcity of year-round water sources. Game species in the WSA include small populations of mule deer, sage grouse, California quail and chukar. The WSA lies along a waterfowl flyway for the Cow Lakes and Batch Lakes wetlands.

Construction of four guzzlers (small wildlife watering devices) has been proposed in the WSA to benefit deer, chukar, quail and sage grouse and nongame species.

Livestock Grazing

A portion of one grazing allotment is within the WSA. Two small areas within the WSA are fenced federal lands and are not part of a grazing allotment. One area (about 320 acres) is located at the southern tip of the WSA; the other area (about 520 acres) is along the eastern edge. Approximately half of the WSA is ungrazed lava.

Table 4 summarizes existing and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Existing livestock developments in the WSA (among the man-made features mentioned in the Naturalness section) include the fence and two reservoirs.

Livestock improvement projects proposed for this area are a reservoir and 6,450 acres of brush control through burning. The reservoir would better distribute livestock and make available an additional 50 AUMs in livestock forage in the allotment; the burn would produce an estimated increase of 840 AUMs of licensed use in the allotment.

Licensed livestock grazing in pastures wholly or partially in the WSA is proposed to be increased by 998 AUMs by allocating available forage. Increases in the WSA would vary according to the amount of pasture in the WSA and other factors such as terrain and vegetation.

Motor vehicle use by livestock operators is generally restricted to the northern and western boundary roads of the WSA. The dead-end road to Junction Pit Reservoir is also used. Livestock management over most of the WSA is easily handled on horseback.

Table 4. Existing and Potential Livestock Use, Clarks Butte WSA (OR-3-120)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA From Projects (AUMs)	Available but Unallocated Forage in Pastures (AUMs)
West Cow Creek (No. 0902)	11,737	04/01-09/30	22	989	890 [1]	998

[1] Increase might or might not result in increased licensed use in the allotment (see narrative).

Utility Corridor Routing

The Bonneville Power Administration (BPA) and Pacific Power & Light (PP&L) Company have under long-term consideration construction of a 500-kV powerline through potential east-west corridor across southeastern Oregon. The proposed route could cross the southeastern corner of the WSA.

Recreation Use

A minor amount of hunting and spelunking (caving) occurs in the WSA. Very little vehicle use occurs within the WSA due to limited ORV designation and the existence of very few ways or roads.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 989 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $7,457 annually, local personal income generated by existing outputs amounts to $15,903 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 31,450 acres of sagebrush steppe and a number of special features associated with the lava flows to the National Wilderness Preservation System (NWPS). The area's highly natural condition, unique lava features, and educational and scientific values would be preserved. Naturalness would be enhanced by closing the one-mile way and allowing it to revegetate.

Any developments on adjacent public or private lands would have little adverse effect upon the area's naturalness or opportunities for solitude because distant vistas are possible only from the two buttes. These buttes are already influenced by exterior man-made features. Increases in exterior man-made features might strengthen the influences but would not increase the area affected.

The **partial alternative** would add 18,250 acres of sagebrush steppe and a number of special features associated with the lava flow to the NWPS. It would preserve the natural condition, lava features, educational and scientific values on this portion of the WSA.

Wilderness characteristics on the 13,200 acres recommended as nonsuitable would be adversely affected by the proposed 6,450-acre brush control burn. The proposed burn would leave a distinct visual edge and adversely affect the naturalness of approximately 17 percent of the WSA. The burn could be repeated if necessary to retain livestock forage gains achieved by the initial burn. The vegetative community within the burned area would be retained at a mid-seral successional stage, and natural processes would not be allowed to operate freely. Mineral development could also adversely affect naturalness and opportunities for solitude in the nonsuitable area.

Under the **no wilderness/no action alternative**, naturalness of the WSA could be adversely affected by development of the potential utility corridor; implementation of proposed livestock and wildlife projects, including one reservoir, four guzzlers and the 6,450-acre brush control burn, and exploration for and development of mineral resources. The proposed burning project would have the same effects as those described for the partial alternative.

Wilderness characteristics would be adversely affected by the construction and presence of any powerlines in the WSA. The naturalness of the southeast corner of the WSA would be affected by the construction of access roads, tower platforms, and towers across the lava flow. This would destroy some of the special features located in this part of the WSA and render the area unnatural. The transmission line could be seen from approximately 70 percent of the WSA.

Opportunities for solitude would be adversely affected by activities during construction of the powerline and by vehicles driven on powerline access roads after the line is constructed. The spelunking opportunities could be adversely affected because the lava surface would be altered. Vehicle access would be increased, which could bring more vehicle-oriented hunters to the area.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 31,450 acres under the **all wilderness alternative** and 18,250 acres under the **partial alternative**. These withdrawals would include the areas rated moderate for geothermal resources and oil and gas, which encompass the entire WSA.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

The proposed 6,450-acre brush control by burning would be allowed under the **partial and no wilderness/no action alternative**. This would reduce vegetation diversity by temporarily reducing the cover and abundance of shrub and forbs (especially big sagebrush), thereby releasing grass species from root competition and allowing the grasses to increase in density. This alteration of plant composition would set plant succession back about 20 to 50 years. The burn may be repeated if necessary to retain livestock forage gains achieved by the initial burn, so the vegetative community in the project area could be retained at a mid-seral stage.

The unique vegetation habitats of the fissures and lava tubes could be buried or altered by construction within the potential utility corridor under the **no wilderness/no action alternative**.

Effects on Wildlife

Under the **all wilderness and partial alternatives**, wildlife habitat would be preserved in areas designated wilderness.

The 4 proposed guzzlers might or might not be allowed depending on a site-specific assessment of whether they would conform with Wilderness Management Policy. If the guzzlers were not allowed, an opportunity to slightly increase wildlife populations would be foregone.

Under the **partial and no wilderness/no action alternatives**, the removal of brush cover by burning on 6,450 acres would likely result in a net loss in the small local mule deer population. For a number of years it would exclude from the burned area some brush-dependent species, such as sage grouse, sage thrashers, and Brewer's sparrow.

Under the no wilderness/no action alternative, the guzzlers would be constructed, slightly increasing populations of mule deer and upland game birds, including chukar, quail and sage grouse.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the proposed 6,450-acre burn to control sagebrush would not be allowed, and an opportunity to increase livestock forage by 840 AUMs in the allotment would be foregone. The proposed reservoir might or might not be allowed, depending on a site-specific assessment of whether it would conform with Wilderness Management Policy. If not allowed, an opportunity to improve livestock distribution and increase livestock forage by 50 AUMs in the allotment would be foregone.

The brush control (vegetative manipulation) project has a benefit/cost ratio greater than 1:1. The reservoir has a benefit/cost ratio less than 1:1.

Since increases in licensed use through allocation of available forage might not be allowed under Wilderness Management Policy, all increases in pastures partially in areas recommended suitable might be foregone. Thus, increases foregone within these pastures would range from 0 to 998 under the all wilderness and partial alternatives.

The **partial and no wilderness/no action alternative** would allow the prescribed burn and construction of the reservoir, which would increase livestock forage in the allotment by about 890 AUMs and improve livestock distribution. Under the no wilderness/no action alternative, allocation of 998 AUMs of available forage throughout the pastures would be realized. Thus, a total increase of 1,888 AUMs in the allotment would be realized under the no wilderness/no action alternative.

Effects on Utility Corridor Routing

The potential east-west utility corridor could not be located within the WSA under the **all wilderness and partial alternatives**. Location outside the WSA would add negligible length to the route.

The corridor could be designated and a powerline constructed across the WSA under the **no wilderness/no action alternative**.

Effects on Recreation Use

Under the **all wilderness and partial alternatives**, there would be little change in recreation use. There may be small increases in hunting if the 4 guzzlers are built. There probably would be a small increase in spelunking (caving), unless powerline construction under the partial alternative destroyed the lava tube caves.

Under the **no wilderness/no action alternative**, there would be a small increase in hunting because of the increase in game following the installation of the guzzlers. There would be a small decrease in spelunking if lava tubes were destroyed during any construction of powerlines across the WSA. Overall recreation use would not change.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the reservoir and 4 guzzlers proposed for this WSA, would be constructed if the area were designated wilderness; nor is it known if the grazing increases would be allowed. It is known that vegetative manipulation projects, such as the proposed burn to control sagebrush, would not be allowed. For analysis purposes it has been estimated that recreation use resulting from proposed wildlife projects would increase by the amounts shown in tables 5 and 6.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, grazing operator access, and/or grazing adjustments were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The **all wilderness alternative** would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $20 per year.

Table 5. Effects of Alternatives on Annual Economic Value, Clarks Butte WSA (OR-3-120) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustments [1]	AUM	0 to +998	0 to +998	+998
Investment [2]	AUM	0 to +50	+890	+890
Big game hunting [3]	RVD	0 to +13	0 to +13	+13
Upland game hunting [3]	RVD	0 to +15	0 to +15	+15
VALUE OF PLANNED INVESTMENTS [4]				
Grazing	$	0 to +377	+6,710	+6,710
Big game hunting	$	0 to +295	0 to +295	+295
Upland game hunting	$	0 to +470	0 to +470	+470
Total [5]	$	0 to +1,147	+6,710 to +7,475	+7,475
Investments [6]	$	0 to -1,148	-1,819 to -2,967	-2,967
Net Economic Value [7]	$	-6 to 0	+4,508 to +4,891	+4,508
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Grazing:				
Adjustments	$	0 to +7,525	0 to +7,525	+7,525
Reduced access [8]	$	-20	-20	
Total	$	-20 to +7,505	-20 to +7,505	+7,525
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-26 to +7,505	+4,488 to +12,396	+12,033

[1] Adjustments to use currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases from proposed wildlife projects.

[4] A vegetative manipulation project involving up to $22,575 total expenditures, and structural projects involving up to $12,800. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Detail may not sum to "Total" due to rounding.

[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

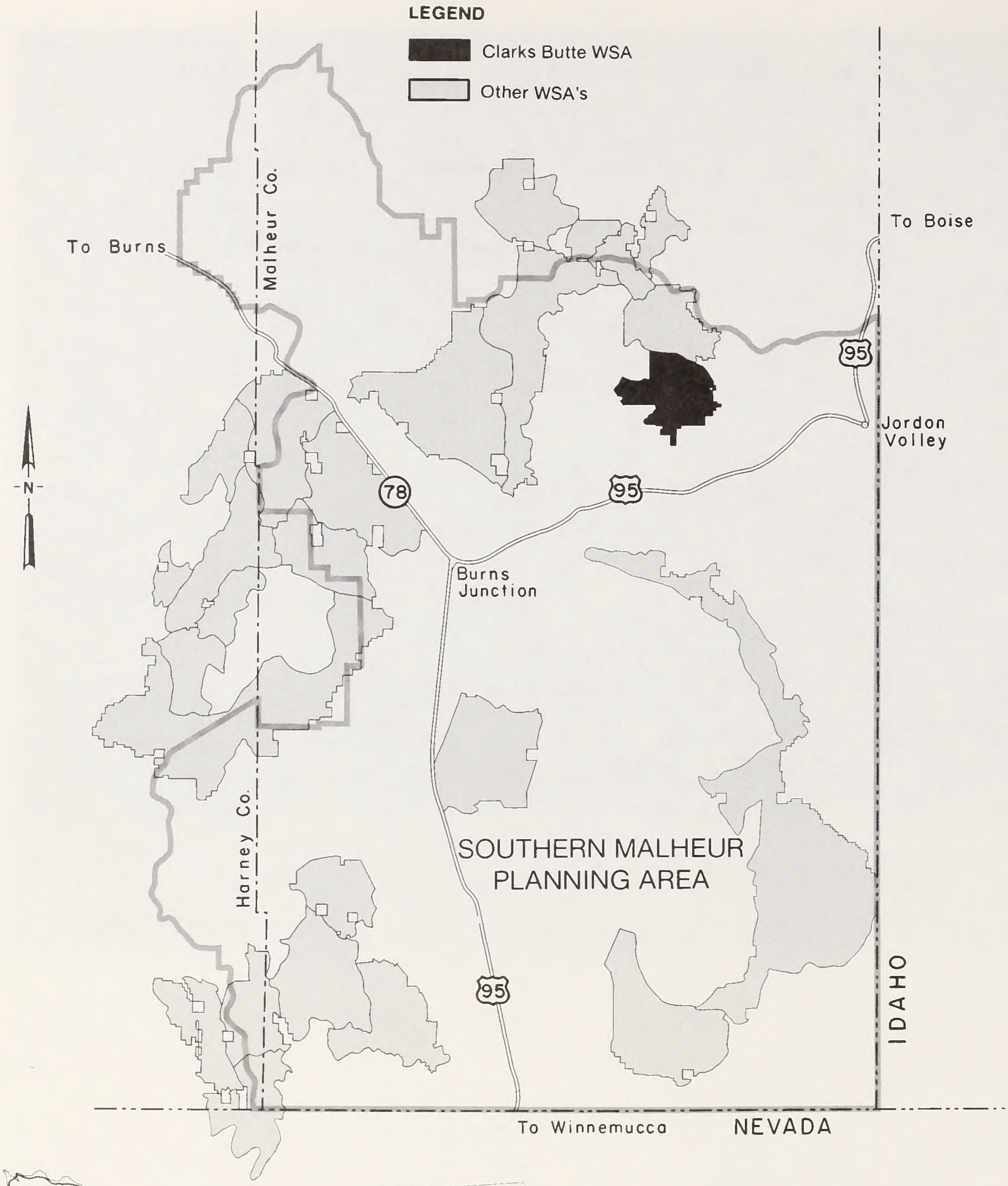
[7] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

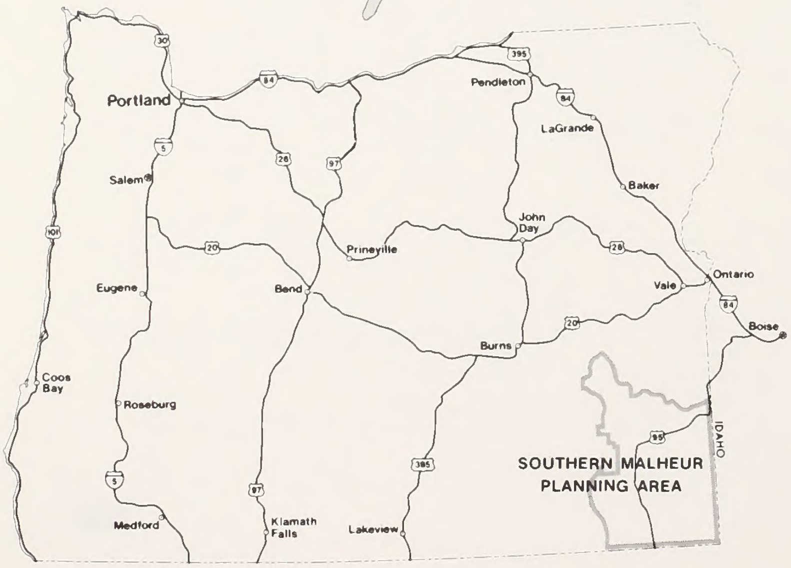
[8] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 6. Effects of Alternatives on Local Personal Income, Clarks Butte WSA (OR-3-120) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustments [1]	AUM	0 to +998	0 to +998	+998
Investment [2]	AUM	0 to +50	+890	+890
Big game hunting [3]	RVD	0 to +13	0 to +13	+13
Upland game hunting [3]	RVD	0 to +15	0 to +15	+15
VALUE OF PLANNED INVESTMENTS [4]				
Grazing	$	0 to +804	+14,311	+14,311
Big game hunting	$	0 to +110	0 to +110	+110
Upland game hunting	$	0 to +199	0 to +199	+199
Construction activity [5]	$	0 to +1,752	+3,101 to +4,859	+4,859
Total [6]	$	0 to +1,113	+14,311 to +14,620	+14,620
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Grazing:				
Adjustments	$	0 to +16,048	0 to +16,048	+16,048
INCOME FROM ALL OUTPUT CHANGES				
All categories [6]	$	0 to +17,161	+14,311 to +30,668	+30,668

[1] Adjustments to utilize currently available but unallocated livestock forage.
[2] Expected future increases due to range improvement investments.
[3] Expected future increases from proposed projects.
[4] A vegetative manipulation project involving up to $22,575 total expenditures, and structural projects involving up to $12,800. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.
[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.





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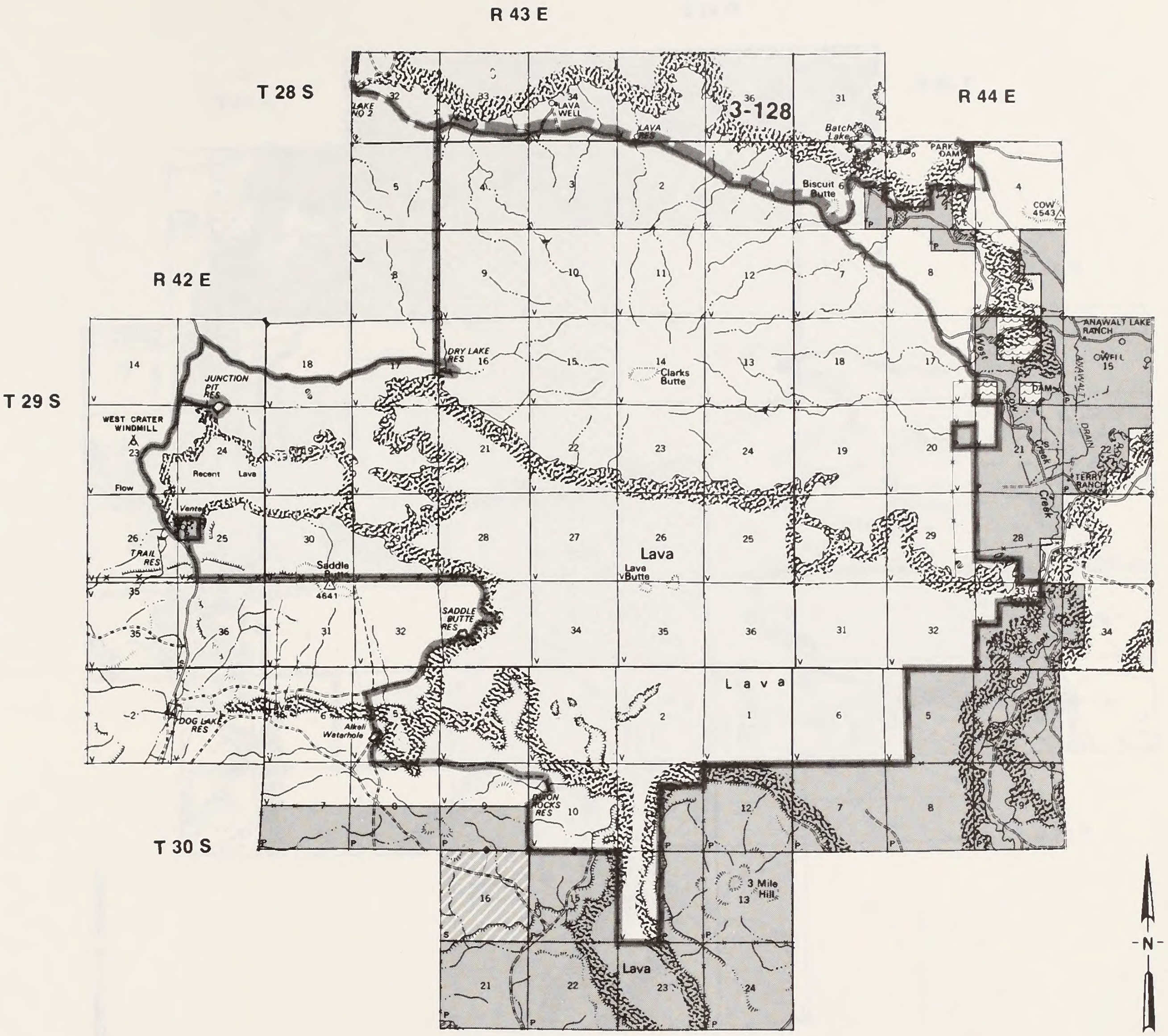
Vale District

Clarks Butte WSA
OR-3-120

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▬ Wilderness Study Area Boundary
- ╍ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▨ State
- ■ Private
- ☐ BLM Surface-State or Private Subsurface (Split Estate)
- ▩ Edge of Lava

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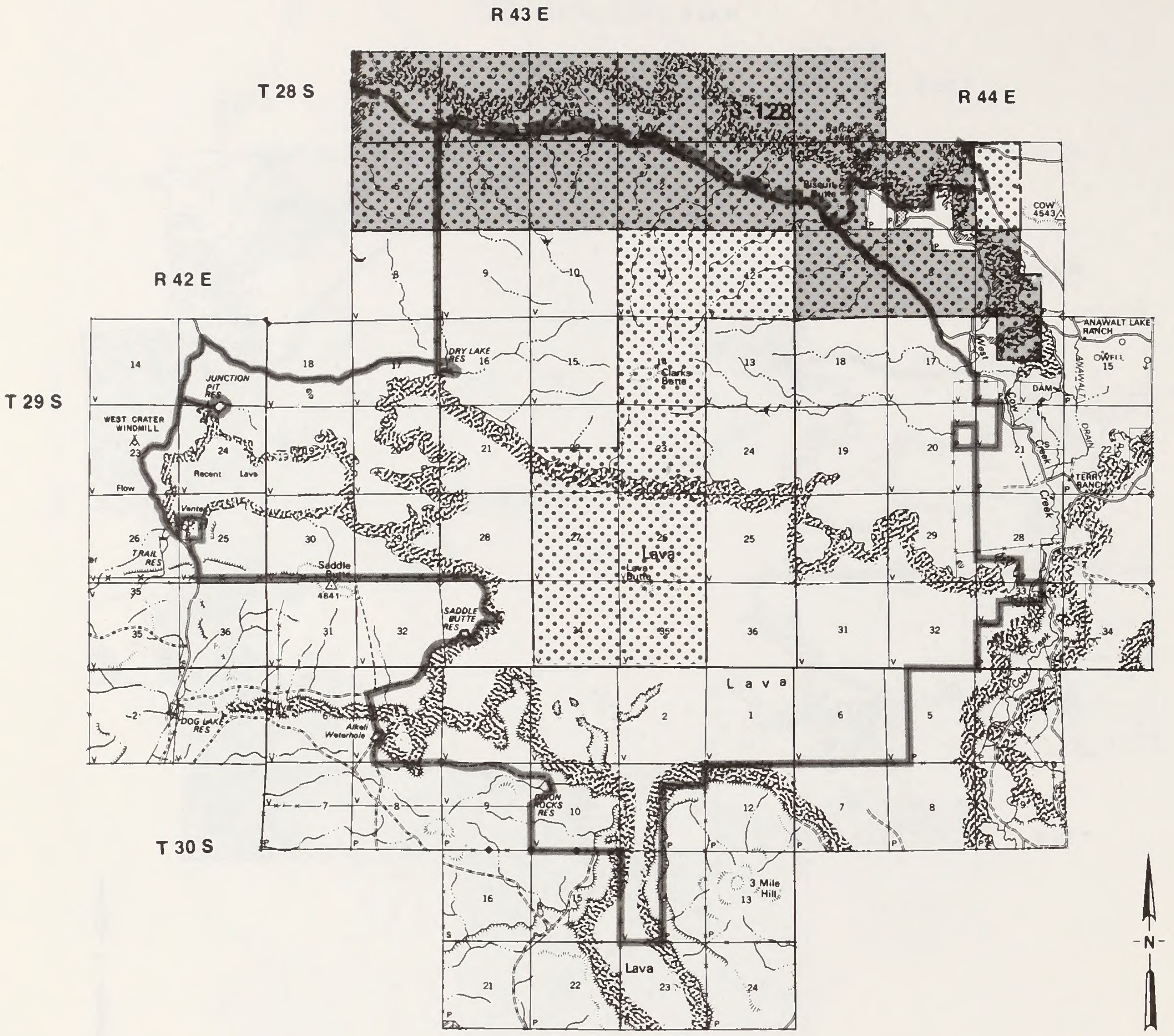
Clarks Butte WSA
OR-3-120

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

– – Boundary of Adjacent Wilderness Study Areas

▨ Jordan Craters ACEC

⁙ Jordan Craters RNA

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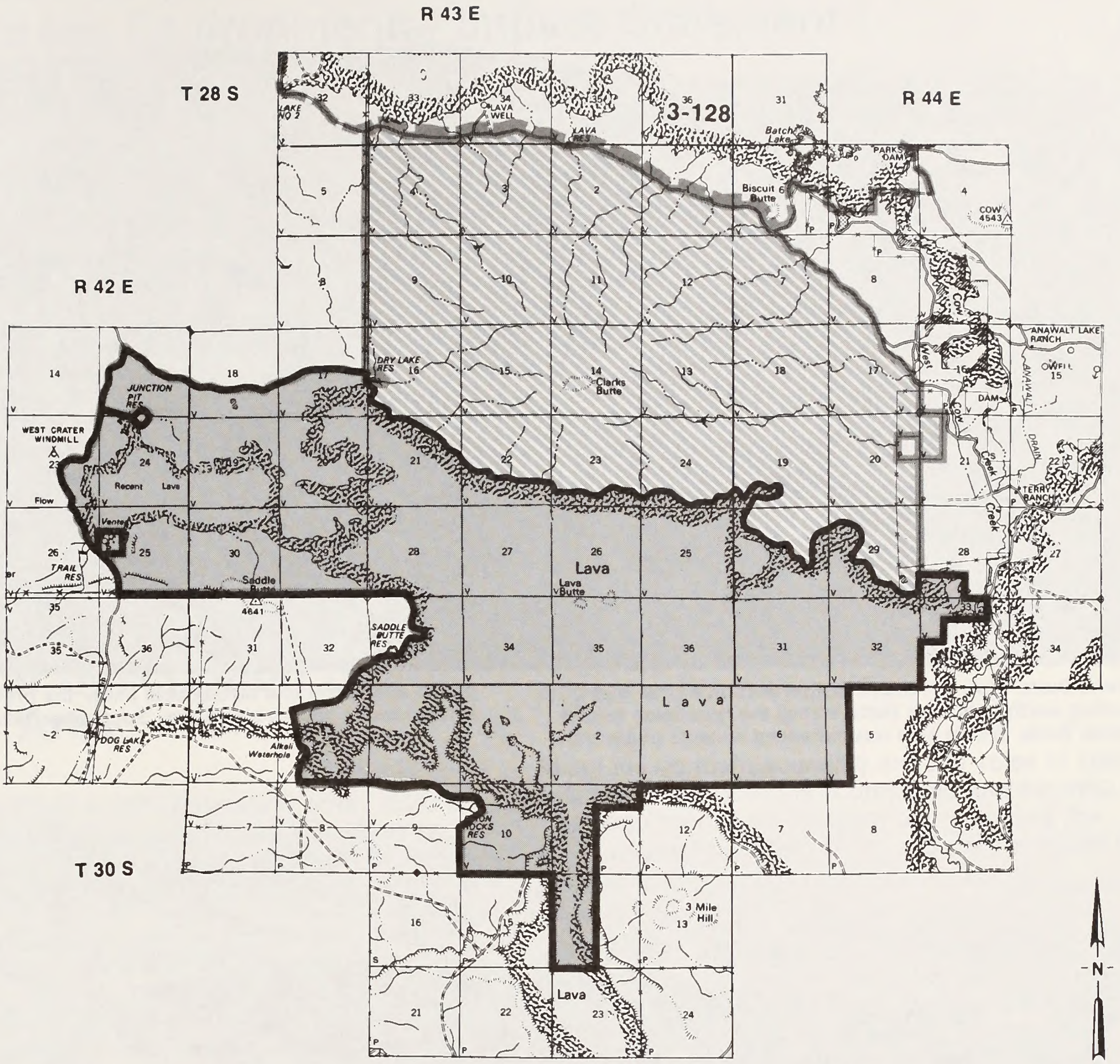
AREA OF CRITICAL ENVIRONMENTAL CONCERN & RESEARCH NATURAL AREA

1 0 1 2 MILES

MAP 3



LEGEND

▬ Wilderness Study Area Boundary

- - Boundary of Adjacent Wilderness Study Areas

▢ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

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PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 4

Clarks Butte WSA, OR-3-120. Central portion of the WSA looking north from Lava Butte across the lava fields toward Clarks Butte. Within area recommended suitable under the partial alternative and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Clarks Butte WSA, OR-3-120. Central portion of the WSA from Lava Butte looking east toward ranches. Foreground suitable under the partial alternative and nonsuitable under the preferred (no wilderness/no action) alternative; background nonsuitable under all alternatives except all wilderness. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Jordan Craters Wilderness Study Area (OR-3-128)

General Description of Study Area

The Jordan Craters wilderness study area (WSA) is located near U.S. Highway 95 in Malheur County, Oregon, approximately 20 miles northwest of Jordan Valley, Oregon (see map 1).

The study area contains 27,560 acres of public land, consisting mainly of the Jordan Craters Lava Flow (see map 2). An 80-acre private parcel is located within the WSA at Crater Lake in the west-central portion of the study area. In addition, a 40-acre parcel is located at the end of a dead-end road to Coffeepot Reservoir in the north part of the WSA. The parcel is not inside the WSA because the WSA boundary extends along the dead-end road, but the parcel is surrounded by BLM land. State lands and the shoreline of Lower Cow Lake form the eastern boundary. The northern boundary is formed by a county road and a section of split-estate land (federally managed surface, state or privately owned subsurface mineral rights). BLM roads form the southern and western boundaries.

Three dead-end roads enter the study area from the northern boundary and another enters from the southern boundary, each road forming part of the WSA's boundary. Their lengths vary from 1/2 to 2 1/2 miles and total 5 miles. They provide access to two wells, two reservoirs, two parcels of private property and the Coffeepot Crater.

Along the northern boundary are 320 acres of split-estate land between the county road and the WSA. The remainder of the northern boundary and the entire western boundary of the WSA are adjacent to public lands.

Most of the WSA is occupied by the bare rock surface of a geologically recent extrusion of basaltic lava. It averages 4,450 feet in elevation and slopes gently toward the east. The surface is irregular with innumerable domes, cracks and sinks. Depressions in the southeastern tip of the flow fall below the water table and a number of potholes, ponds and small lakes have been formed, the largest known as Batch Lake. Vegetation on the lavas is composed principally of lichens and mosses.

Topography adjacent to the lava flow varies from flat to gently rolling. A north-south ridge, having the highest elevations in the WSA, borders the lava flow on the west. The predominant vegetation outside the flow is a Wyoming big sagebrush-bluebunch wheatgrass community.

Interrelationships

Most of the WSA overlaps portions of the Jordan Craters Research Natural Area (RNA) and Area of

Critical Environmental Concern (ACEC) (see map 3). Only the western portion and four peninsula-like fingers along the eastern boundary of the WSA are not included in the RNA/ACEC. It also extends beyond the northern and southern boundaries of the WSA.

The RNA was designated in 1975 to protect unique ecological, geological and biological features for scientific and educational endeavors. The ACEC was designated in 1983 to provide special management to protect these features. Special management for the ACEC includes:

- protection from surface disturbing activities,

- restricting ORV (off-road vehicle) use to designated routes,

- posting road signs to deter off-road travel and unauthorized mineral extraction, and

- managing livestock grazing to protect pristine vegetation and the present condition of the three vegetative type cells identified through the Natural Heritage Program.

These restrictions currently apply to the portion of the study area within the ACEC and would continue to apply whether or not the area is designated wilderness.

The Jordan Craters WSA is adjacent to the Owyhee Breaks WSA (OR-3-59) on the north and the Clarks Butte WSA (OR-3-120) on the south. They are separated from Jordan Craters WSA by roads.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- the area's outstanding opportunities for solitude, spelunking, sightseeing, birdwatching and hiking, as well as the area's naturalness, unique volcanic features and their associated unique and unusual habitats,

- the presence of privately owned inholdings in the WSA (effects of wilderness designation on private lands are addressed in the Statewide EIS volume),

- potential development of mineral rights, including development of the area's cinder and slab lava rock, and

- possible increased visitor use due to wilderness designation, particularly effects on the area's unique and fragile lava features.

Also raised as an issue was the possibility of combining the Clarks Butte WSA with the Jordan Craters WSA into a single wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- partial (preferred alternative)
- no wilderness/no action

An alternative which would combine this WSA with the Clarks Butte WSA by closing the road between them is not analyzed. The road provides access from the populated Jordan Valley area to the more remote Mud Lake area. The road is not being considered for closure because it is used by crews who maintain several range projects throughout the Mud Lake area. Closing this road would cause a 15- to 30-mile detour.

All Wilderness

The all wilderness alternative would recommend all 27,560 acres of public land in the study area suitable as wilderness (see map 2). For purposes of analysis, it is assumed the two inholdings would remain under private ownership, and the four dead-end roads would remain open.

Enhanced Wilderness

Under the enhanced wilderness alternative, all 27,560 acres of public land would be recommended suitable as wilderness and the four dead-end roads totaling five miles would be closed (see map 4). An attempt would be made to acquire the two parcels of private property (120 acres) within the WSA and the one parcel of split-estate land (320 acres) along the northern boundary. These parcels could be acquired by purchase or exchange with willing landowners.

Assuming acquisition of the inholdings and adjacent parcels, total area recommended suitable under this alternative would be 28,000 acres.

Partial (Preferred Alternative)

Under the partial alternative, 22,200 acres would be recommended suitable as wilderness. This would include all of the lava flow plus approximately five square miles of adjacent rangeland northwest and south of the lava (see map 5). Some 5,360 acres would be recommended nonsuitable. The two dead-end roads in the area recommended suitable would remain open to allow unrestricted access to Lava Well for maintenance of the well and to provide vehicle access to Coffeepot Crater.

The northern boundary would follow legal subdivisions (section lines) between the split-estate and the private parcel near Coffeepot Reservoir. It would exclude a narrow strip of the study area just south of the existing northern boundary. The western boundary would follow the dead-end road to Crater Lake and then the way (a vehicle route established and maintained solely by the passage of vehicles) to Mud Lake.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features, in addition to ACEC constraints, relevant to this analysis:

- restrictions of vehicles to existing routes outside the ACEC; and

- continued availability for mineral leasing with no-surface-occupancy restrictions and for location of mining claims, and continued closure to development of salable materials.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The areas recommended as suitable for wilderness are manageable as wilderness in all of the alternatives. The relatively large size, high degree of naturalness and rugged, uninviting terrain of the WSA would facilitate its manageability as wilderness.

Portions of the area that would be designated wilderness in the all wilderness alternative could be difficult to manage if minerals were developed on private surface and split-estate inholdings. If the slab lava were determined to be a locatable mineral under the General Mining Law, mining of the rock could create a management problem. However, this is not very likely to occur. Any increase in recreational use could pose a threat to the area's fragile physical features and ecological systems.

The enhanced wilderness alternative would solve the potential manageability problems along roads and around the private inholdings. The possibility of development on private surface and mineral estates would be eliminated if the acquisitions proposed under this alternative were successful.

Table 1. Summary of Proposed Management Under Each Alternative, Jordan Craters WSA (OR-3-128)

Proposed Management	All Wilderness	Enhanced Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	27,560	27,560	22,200	0
Acres Closed to ORVs by Wilderness Designation	27,560	27,560	22,200	0
Miles of Roads Closed	0	5	0	0
Miles of Ways Closed	3	3	0	0
Acres of Full Fee Estate Acquired [1]	0	120	0	0
Acres of Split Estate Acquired [1]	0	320	0	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	27,560	27,560	22,200	0
Unallocated Existing Forage Allocated (AUMs)	0-1,164	0-1,164	0-1,164	1,164

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Vehicle access along the way from Mud Lake to Crater Lake could lead to theft of slab rock along the lava edge. This could also occur along the dead-end roads to Coffeepot Crater and Lava Well. Any development of the private and split-estate parcels adjacent to the partial alternative boundary would adversely influence the suitable area's solitude and naturalness characteristics.

Rationale for the Selection of the Preferred Alternative

The partial alternative is preferred because this alternative would recommend as suitable for wilderness the portion of the WSA with the highest wilderness values, recommend as nonsuitable a portion of the WSA with limited wilderness values, and enhance manageability of the area as wilderness. The boundary would eliminate the portion of the WSA that is influenced by exterior man-made features and which has little or no opportunities for solitude and recreation; this portion also contains Blowout Reservoir and the 40-acre private parcel at Coffeepot Reservoir.

It would also exclude an area of few wilderness values located west of the lava field and the 80-acre private parcel surrounding Crater Lake. The featureless terrain of this portion offers little opportunity for solitude and primitive recreation.

The portion that would be recommended suitable as wilderness contains high wilderness values and a natural setting only slightly influenced by man. There are outstanding recreation opportunities which include hiking, sightseeing, bird watching and spelunking. Outstanding opportunities for solitude are available because of the area's broken topography.

Unique or special features include numerous extraordinary, young volcanic features; uncommon vegetation at Batch Lakes, Fern Dome and the two kipukas (isolated islands of exposed land that is older than the surrounding lava flows); several unusual birds; big-eared bats; and an excellent opportunity for educational and scientific study of the area's young lava features and ecological relationships.

Wilderness designation would contribute to expanding diversity of the existing National Wilderness Preservation System through the addition of the WSA's young lava fields with their unique features. There currently are no major resource conflicts occurring in the WSA and none are foreseen.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Jordan Craters WSA is in a highly natural condition. The lava flow occupying most of the eastern three-quarters of the WSA is essentially devoid of any man-made features and is affected only slightly by man-made sights and sounds outside the study area. Most of these signs of human activity are scattered around the perimeter of the WSA except for a relatively high concentration of man-made features in the southwestern portion.

There are 9 man-made features inside the study area, including 4 fences, 1 rock corral, 2 reservoirs, a 3-mile way, and remnants of a short dirt access bridging a finger of lava. These features influence about 3 percent of the WSA. (The area of influence is an estimate of the acreage in the WSA from which the developments can be seen.)

Developments outside the WSA slightly diminish the naturalness of the WSA, including developments related to livestock management and two old cabins.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The configuration, large size, and broken topography of the WSA provide outstanding opportunities for solitude, especially in the central and southeastern portions of the WSA; for example, in the lava flow and along the ridge bounding the western edge of the flow.

Topography along the northern, western and southern boundaries

Table 2. Summary of Environmental Consequences of Alternatives, Jordan Craters WSA (OR-3-128)

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 27,560 acres to NWPS. Includes unique and very recent volcanic features, diversity of ecosystems, outstanding solitude and recreation opportunities and highly natural area. Solitude and naturalness would benefit from way closure. Fragile features protected from overuse. Quality of lava/sage transition ecosystem enhanced along 3 miles of revegetated way. Development of mineral resources on inholdings could adversely affect wilderness values. The area would be manageable as wilderness.	Would add 28,000 acres to NWPS, assuming acquisition of 440 acres of private inholdings and adjacent split-estate land. Effects would be similar to all wilderness alternative, except that revegetation of 5 miles of closed roads in addition to 3 miles of way would add to naturalness of the area, and acquisition of inholdings would preclude adverse effects of mineral development on inholdings. Area recommended suitable would be manageable as wilderness.	Would add 22,200 acres to NWPS. Effects similar to all wilderness alternative because all features which contribute to area's many wilderness values would be preserved. The limited number of wilderness values in portion recommended nonsuitable could be adversely affected by mineral development. Area recommended suitable area would be manageable as wilderness.	Slight potential for reduction of solitude and recreation opportunities, degradation of naturalness and alteration or loss of special features because of mineral development.
Energy and Mineral Development	Development precluded on 27,560 acres, including 27,560 acres with moderate potential for geothermal, oil and gas.	Same as all wilderness alternative except development precluded on an additional 440 acres, if acquired.	Development precluded on 22,200 acres, including 22,200 acres with moderate potential for geothermal, oil and gas.	No impact. Continued restrictions pertinent to RNA.
Livestock Grazing	Allocation of 1,164 AUMs of available forage in pastures might be foregone.	Same as all wilderness.	Same as all wilderness.	Increase of 1,164 AUMs in pastures through allocation of available forage.
Recreation Use	Slight inconvenience to vehicle-oriented recreationists due to closure of one way along west edge of lava. Minor reduction of vehicle-oriented recreation use. No significant increase in primitive recreation activity. Net effect on overall recreation use would be small.	Greater inconvenience to vehicle-oriented recreationists than all wilderness due to closure of all roads and ways. Coffeepot Crater and the western lava edge would be inaccessible to vehicles. Some net decrease of vehicle-oriented recreation use. Overall recreation use would decrease slightly.	Portion west of RNA would be opened to ORV use. Allows vehicle use of all existing routes. No change in vehicle-oriented recreation use. Slight net increase in overall recreation use.	Little change in amount of primitive or vehicle-oriented recreation use. Portion west of RNA open to ORV use. Allows use of all existing routes. No change in existing recreation use.
Economic Value and Local Income	Increase in economic value and local personal income by $8,771 and $18,717, respectively, if the full adjustment to use currently available but unallocated livestock forage were allowed. Decrease in economic value of $6 and no change in local personal income if the adjustment were not allowed. The maximum increase in transportation costs to livestock operators would be $6.	Same as all wilderness.	Same as all wilderness.	Increase in economic value and local personal income by $8,777 and $18,717, respectively, from adjustments to use currently available but unallocated livestock forage.

provides the least effective screening. These areas, along with Coffeepot Crater, Cow Lakes, Crater Lake and Batch Lake receive the highest visitor use; consequently, they provide the least opportunities for seclusion.

Sights and sounds of activities outside of the WSA include vehicle travel on boundary roads and dead-end access roads, recreation at Cow Lakes, ranching activities to the east and southeast of the WSA, and military aircraft training flights overhead. These intrusions are generally brief or very distant and do not penetrate far into the WSA.

The WSA offers excellent opportunities for exploratory and recreational spelunking. A complete inventory of lava caves has not been conducted; only caves near the Coffeepot Crater have been explored. The WSA offers exceptional sightseeing of the botanic, geologic and ecologic features throughout the lava field area and excellent opportunities for bird watching and nature photography. Day hiking, backpacking and camping are usually associated with these activities.

Special Features

The Jordan Craters WSA contains basaltic lava that may be between 4,000 and 9,000 years old. Because the lava flow is relatively recent, there has been minimal erosion of such unique volcanic features as kipukas, pahoehoe (smooth) lavas, pressure ridges, lava channels, pits, tubes and blisters, spatter cones and a large cinder cone. The area represents a preserved example of the volcanic aspects of geologic history.

Five unique and unusual habitats are associated with the Jordan Crater flow:

- The abrupt transition zone between the lava and the surrounding rangeland is characterized by a diverse natural community. Vegetation consists of brush and bunchgrasses kept relatively lush by runoff from the lava surface onto deep soils built up along the lava's edge. This provides cover and feed for a variety of mammals, birds and reptiles.

- The lava surface offers a harsh habitat of extreme climatic and soil conditions with little available water. Vegetation consists principally of lichens and mosses. Animals include a few small birds and rodents.

- The lava flow subsurface contains a number of collapsed tube segments. Some of these segments provide stable temperature and humidity which promote the growth of mosses and ferns not normally found in the harsh, dry climate of the region. The Townsend's big-eared bat, which inhabits caves in the WSA, is considered quite uncommon in eastern Oregon and is limited to lava tube caves of the region.

- The ground waters surfacing in pools, ponds and lakes of the Batch Lake area support unusual vegetation and an abundance of diverse wildlife. Several unusual bird species are drawn to the area at various times of the year, including the white pelican, the black-crowned night heron, the long-billed curlew, the northern bald eagle (federally listed as threatened in Oregon), and the sandhill crane.

- The lava flow contains two small kipukas (of about 12 acres each) and nearly surrounds a large peninsula of rolling hills in the southwestern portion of the WSA. The kipukas have probably never been grazed by livestock and are therefore valued as unique examples of a pristine sagebrush steppe environment. The peninsula has received only occasional light grazing because of its isolated nature and lack of water.

Results of previous scientific studies and the fact that the WSA includes part of the Jordan Craters RNA and ACEC indicate the scientific and educational importance of the WSA.

Two plant species found in the WSA, *Dryopteris filix-mas* and *Muhlenbergia minutissima*, are of special interest. (The Vegetation section further discusses these plants.)

The WSA offers a variety of unique and interesting scenery due primarily to the lava flows. Scenic qualities are outstanding.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, the WSA lies in the Intermountain Sagebrush Province and its potential natural vegetation is sagebrush steppe. Of the plant communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, the WSA represents a big sagebrush/bluebunch wheatgrass community.

Boise, Idaho is the only standard metropolitan statistical area with a population over 100,000 located within 5 hours' driving time of the study area.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment sampling by BLM geologists. Technical details of the findings of the evaluation are in a BLM report titled "Assessment of Geology, Energy, Mineral Resources of Jordan Craters-Clarke Butte Geologic Resource Area".

The WSA is within the Jordan Craters-Clarke Butte geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the mineral potential classifications in the WSA.

Oil and gas and geothermal heat are the two main potential energy resources in the Jordan Craters WSA. Because of very young volcanism, the entire study area is moderately favorable for geothermal potential. Warm springs and wells also occur in the vicinity. Oil and gas potential, rated moderate throughout the WSA, largely depends on the presence or absence of suitable marine rock at the subsurface. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depth.

There were no oil and gas or geothermal leases and no mining claims in the WSA as of January 1, 1984.

Most of the rocks exposed in Jordan Craters WSA are volcanic, predominantly basalt, rhyolite, and welded ash flow tuffs. The youngest lava, an olivine basalt, flowed southeastward from Coffeepot Crater for a maximum of 10 miles filling stream valleys that were part of the Cow Creek drainage system. Studies based on growth rates of lichen and on weathering rates of exposed and unexposed basalt suggest that the flow may be between 4,000 and 9,000 years old.

Table 3. Classification of Energy and Mineral Potential, Jordan Craters WSA (OR-3-128)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, silver, mercury)	Entire WSA	2	B
Geothermal	Entire WSA	3	B
Uranium/Thorium	Entire WSA	1	B
Coal	Entire WSA	1	C
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	B
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	1	B
Diatomite	Entire WSA	1	B
Zeolites	Entire WSA	1	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Vegetation

About two-thirds of the WSA is a lava flow which is essentially devoid of vegetation. The remainder of the WSA is a Wyoming big sagebrush/bluebunch wheatgrass plant community, which is in mid-seral stage. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.)

Several plants (especially fern species) found within lava tubes and fissures in the lava flow are uncommon to this area.

Two plant species found in the WSA (mentioned in the Special Feature section) are of special interest: *Dryopteris filix-mas* and *Muhlenbergia minutissima*. These species are on List 2 of the Oregon Natural Heritage Plan's "Rare, Threatened, and Endangered Plants and Animals of Oregon."

Wildlife

Over three hundred wildlife species have been identified within the WSA. This unusually high number of animal species is due to the unique and diverse habitats.

Animal distribution may be categorized into three major habitat types: the lava surface, surrounding rangeland and lava edge, and the aquatic habitat associated with the numerous lakes, ponds and marshes. Only a few species inhabit the lava surface. Eight species of bats have been observed here, including the Townsend's big-eared bat. Although this species has been given no special status, it is considered quite uncommon and the small population appears to be on the decline. This bat is restricted to lava tubes and small caves within the WSA.

The rangeland/lava edge provides habitat for many species common to the area. Mammals include deer mouse, bushy-tailed woodrat, cottontail rabbit, and least chipmunk. Birds are varied, including chukar, loggerhead shrike, rock wren, and canyon wren. Reptiles are plentiful, especially the western yellow-bellied racer, western rattlesnake, and gopher snake. Lizards include the western fence lizard and side-blotched lizard.

The most diverse and numerous wildlife are associated with the lakes, ponds and marshes. Open water and marshes are rare in the region and up to 200 species of migratory waterfowl, numbering in the thousands, use the aquatic habitat each spring and fall. Several unusual or unique bird species are attracted to these areas to feed or nest, including white pelicans, sandhill cranes, black-crowned night herons, long-billed curlews and northern bald eagles. Beaver and muskrat make use of the willows and aquatic vegetation near the lakes.

Livestock Grazing

Portions of four grazing allotments are within the WSA. Table 4 shows existing and potential livestock use in AUMs (animal unit months, amount of forage needed to sustain a cow and a calf, or equivalent animals, for one month.)

Existing livestock developments in the WSA (among the man-made features mentioned in the Naturalness section) include 4 fences, a rock corral, and 2 reservoirs.

No new livestock improvement projects are proposed for this WSA.

Licensed livestock grazing in pastures wholly or partially in the WSA is proposed to be increased by 1,164 AUMs by allocating available forage. Increases in the WSA would vary according to the amount of pasture in the WSA and other factors such as terrain and vegetation.

Motor vehicle use by livestock operators in the WSA is restricted to the boundary and dead-end roads due to the difficulty of the terrain.

Recreation Use

Notable recreation activities occurring in the WSA are sightseeing, spelunking (caving), bird watching and nature photography. There is some hunting adjacent to the lava flow, and some fishing occurs in the Batch Lake area.

An estimated 650 visitors annually drive to Coffeepot Crater. Travel is confined to existing roads and ways because of the lava and the RNA designation.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 1,605 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $12,101 annually, and local personal income generated by existing outputs amounts to $25,808 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible,

Table 4. Existing and Potential Livestock Use, Jordan Craters WSA (OR-3-128)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA AUMs	Available but Unallocated Forage in Pastures (AUMs)
McCain Springs (No. 0505)	17,357	04/01 to 10/15	2	307	0
Lodge (No. 0901)	3,150	04/01 to 10/31	39	1,035	0
West Cow Creek (No. 0902)	9,738	04/01 to 09/30	2	332	1,164
Oliver (No. 0905)	560	04/01 to 09/30	15	76	0
Total	32,798			1,605	1,164

but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 27,560 acres to the National Wilderness Preservation System (NWPS). It would preserve a number of unique and unusual features of recent volcanism, related ecosystems, and a sampling of the sagebrush steppe vegetation ecosystem. In addition, the area offers outstanding opportunities for solitude and primitive recreation in a near pristine setting

Naturalness would be enhanced by closing the 3 miles of way along the lava edge and allowing it to revegetate.

Developments on the private inholdings are ranch-related and this type of use is not expected to change. However, if oil and gas or geothermal resources were developed on the inholdings, wilderness values in the surrounding public lands would be adversely affected.

Opportunities for solitude would be enhanced due to closure of the way along the western edge of the lava.

It is not known if recreation use would increase or decrease as a result of wilderness designation, but any changes probably would be small. Any increase in users would lessen opportunities for solitude and, if uncontrolled, could adversely affect the area's special features. However, under BLM's wilderness management policy, use would be controlled to prevent wilderness features from being adversely affected. Revegetation of the 3-mile way would increase the natural quality of the abrupt lava/sage transition.

The **enhanced wilderness alternative** would add 28,000 acres to the NWPS, assuming the 440 acres of private inholdings and adjacent split-estate land could be acquired. This would eliminate the possibility of development of these lands.

Under the enhanced wilderness alternative, naturalness of the area would be enhanced with revegetation of the 3-mile way and the 5 miles of closed roads. Opportunities for solitude would be increased by acquisition of the interior private lands, and adjacent split estate, and by closure of dead-end roads and the way along the lava. Recreation opportunities would be affected in the same manner as under the all wilderness alternative.

The **partial alternative** would add 22,200 acres to the NWPS. It would preserve most of the area's unique and unusual features of recent volcanism, related ecosystems, and a sampling of the sagebrush steppe vegetation and ecosystem. In addition, it would preserve the area's outstanding opportunities for solitude and primitive recreation in a near pristine setting.

Under the partial alternative, the area recommended suitable as wilderness would be less affected by developments than under the all wilderness and enhanced wilderness alternatives. Wilderness values in the portion recommended as nonsuitable could be adversely affected by oil and gas, geothermal, or other mineral development such as mining of metallic minerals. Facilities to develop oil and gas or geothermal resources could be installed in almost any part of the nonsuitable portion because three-fourths of this portion of the study area is outside the RNA. Inside the RNA, any oil and gas and geothermal leasing would have no-surface-occupancy restrictions.

The portion recommended suitable for wilderness would retain the outstanding opportunities for solitude. Although the wilderness area would be smaller than under the all wilderness and enhanced wilderness alternatives, the terrain of the WSA is so broken that the net effect on the opportunities for solitude would be slight. The nonsuitable western portion of the WSA offers limited opportunities for solitude.

The partial alternative would offer as many opportunities for primitive recreation as the all wilderness and enhanced wilderness alternatives. Almost all of these opportunities are related to features that would be included in the area recommended as suitable for wilderness. All of the wilderness special features would be preserved.

Under the **no wilderness/no action alternative**, wilderness values could be adversely affected by mining. As long as the slab lava is considered a common variety of mineral, and therefore a salable mineral not subject to claim under the General Mining Law, it will be subject to the BLM District Manager's decision to not sell minerals in the RNA. If, in response to an appeal or a lawsuit, administrative law judges or the courts determine that the lava is not a common variety of mineral and therefore locatable under the General Mining Law, it could be mined in the WSA.

In most cases where the issue has been raised, the lava has been determined to be a common variety of mineral, but there have been instances where it was determined to be locatable. If the lava were mined, the area's special wilderness features could be impaired or destroyed. Mining activity would reduce opportunities for solitude, and it would reduce opportunities for recreation if lava features were removed or collapsed, if wildlife were driven away, or if scenic quality were impaired.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 27,560 acres under the **all wilderness alternative**; 27,560 acres plus an additional 440 acres if private inholdings and bordering split-estate land is acquired, as proposed under the **enhanced wilderness** alternative; and 22,000 acres under the **partial alternative**.

Included within these withdrawals would be the areas rated moderately favorable for geothermal resources and oil and gas, which encompass the entire WSA.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Nonsuitable portions under the partial and no wilderness/no action alternatives which are within the RNA are not currently subject to sale of slab lava and cinders. In addition, leases within the RNA will contain no-surface-occupancy stipulations.

Effects on Livestock Grazing

Since increases in licensed use through allocation of available forage might not be allowed under Wilderness Management Policy, all increases in pastures partially in areas recommended suitable might be foregone. Thus, increases foregone within these pastures would range from 0 to 1,164 AUMs under the **all wilderness, enhanced wilderness and partial alternatives**.

Under the **no wilderness/no action alternative**, allocation of 1,164 AUMs of available forage throughout the pastures would be realized.

Effects on Recreation Use

Under the **all wilderness alternative**, the access road to Coffeepot Crater would remain open; vehicle-oriented recreation would not be significantly affected except that closure of the way along the west edge of the lava would eliminate the small amount of vehicle-oriented recreation that occurs there now.

Wilderness designation might cause a moderate increase in primitive recreation activities in the area. Overall, there would be no significant impact to recreation use under this alternative.

Under the **enhanced wilderness alternative**, closure of all roads and ways in the WSA would inconvenience most current recreation users because vehicle access to Coffeepot Crater would be prohibited. Visitors would need to walk approximately one mile to the crater and its adjacent features. Vehicle access for hunting along the road to Crater Lake and the way along the west edge of the lava would not be allowed. It is not known what percentage of visitors would be turned away by the one-mile walk to Coffeepot Crater or how much travel along the Crater Lake road and way is hunter-related. However, this alternative would probably result in a slight net decrease in overall recreation use.

Under the **partial alternative**, there would be no significant impacts to vehicle-oriented recreation. All current vehicle access routes would remain available. The restriction of vehicles to existing routes would continue in effect in the RNA. The nonsuitable portion of the study area west of the RNA would be open to off-road travel. Primitive recreation opportunities would be enhanced under this alternative, resulting in a slight increase in overall recreation use in the WSA area.

Under the **no wilderness/no action alternative**, primitive recreation use probably would change little from current levels. Portions of the study area outside the RNA would be open to off-road use, but vehicles inside the RNA would remain restricted to existing routes.

The effect of this alternative on the amount of overall recreation use in the area, if any, probably would be small.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time if the grazing increases would be allowed.

The column for the wilderness alternatives shows the effects as a range of values dependent upon whether the grazing adjustments were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The wilderness alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $6 per year.

Table 5. Effects of Alternatives on Annual Economic Value, Jordan Craters WSA (OR-3-128) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +1,164	+1,164
VALUE OF EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustments	$	0 to +8,777	+8,777
Reduced access [2]	$	-6	0
Total	$	-6 to +8,771	+8,777

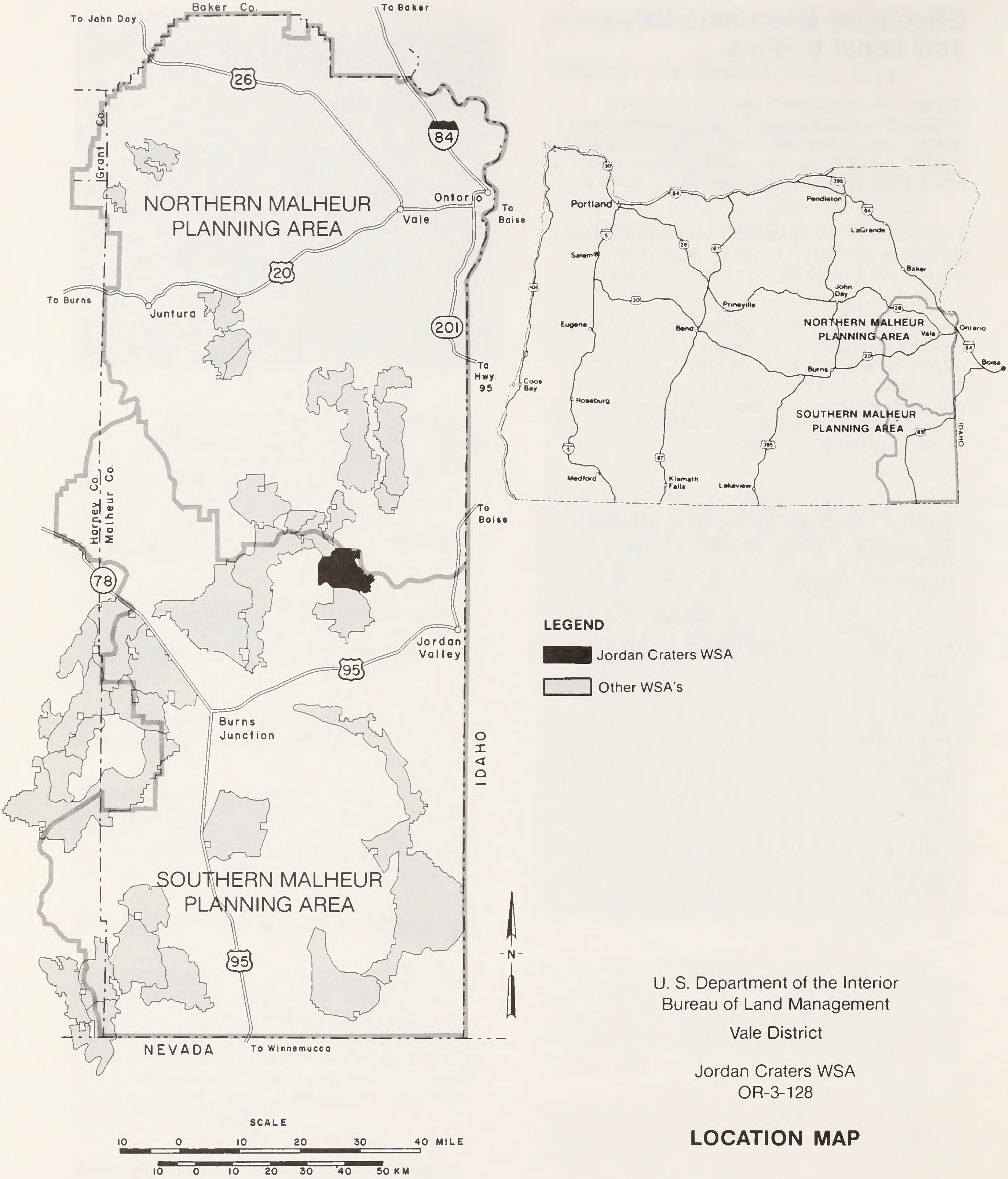
[1] Adjustments to use currently available but unallocated livestock forage.

[2] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 6. Effects of Alternatives on Local Personal Income, Jordan Craters WSA (OR-3-128) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +1,164	+1,164
INCOME OTHER EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustments	$	0 to +18,717	+18,717

[1] Adjustments to utilize currently available but unallocated livestock forage.



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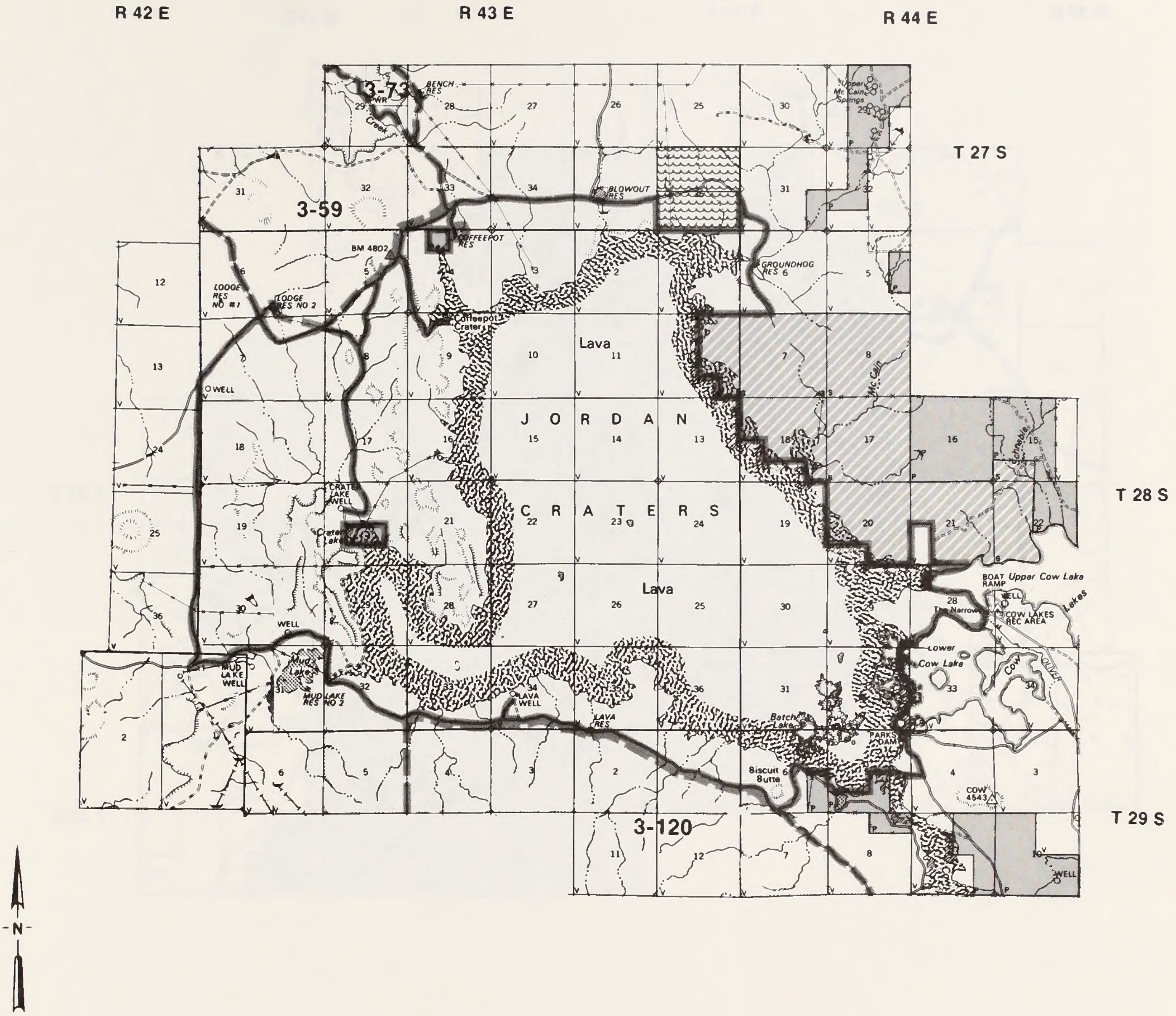
Jordan Craters WSA
OR-3-128

LOCATION MAP

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ State

■ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

▩ Edge of Lava

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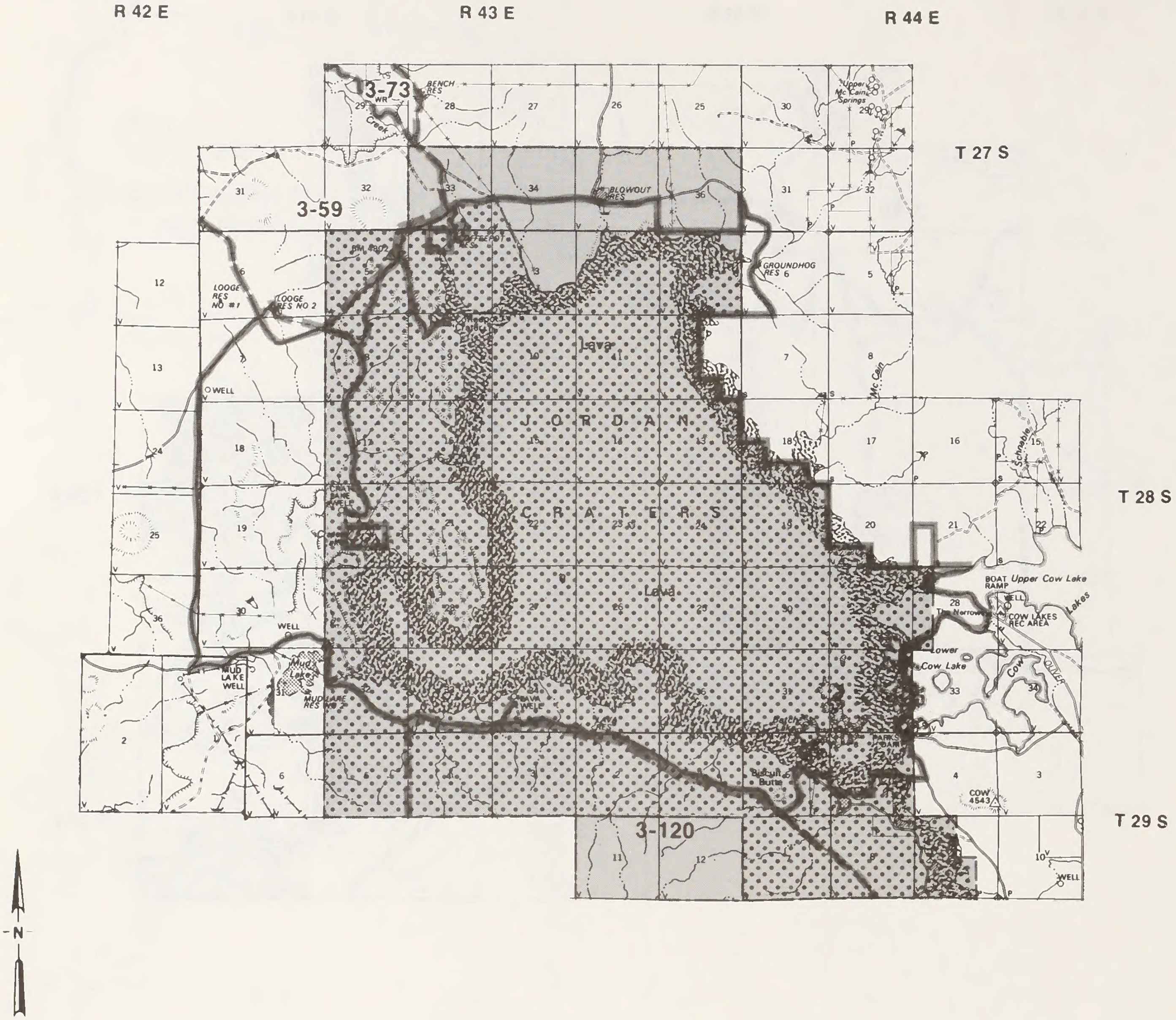
Jordan Craters WSA
OR-3-128

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬	Wilderness Study Area Boundary
▬ ▬	Boundary of Adjacent Wilderness Study Areas
▨	Jordan Craters ACEC
⁘	Jordan Craters RNA

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Jordan Craters WSA
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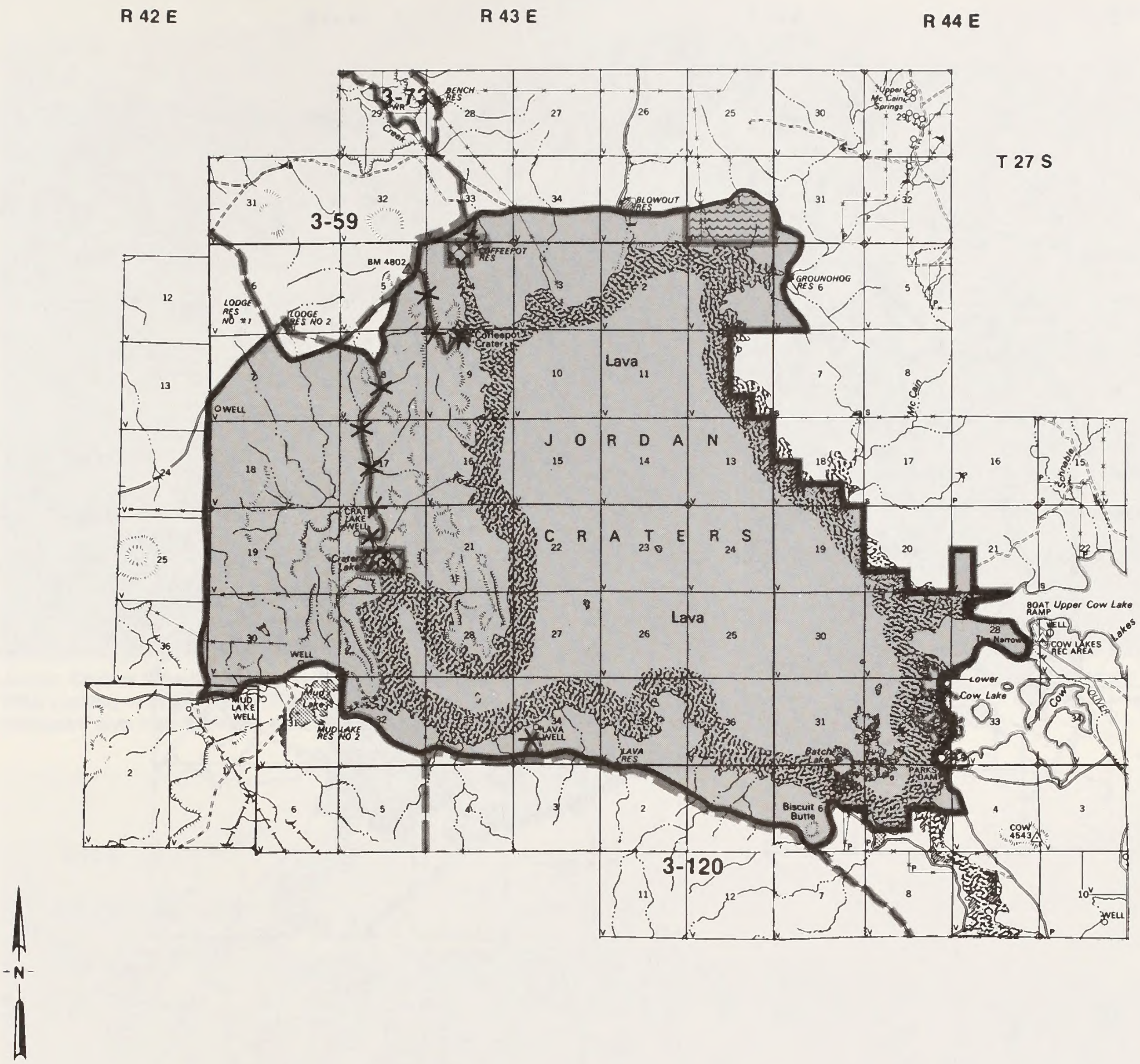
AREA OF CRITICAL ENVIRONMENTAL CONCERN & RESEARCH NATURAL AREA

1 0 1 2 MILES

MAP 3



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

▢ Recommended Suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

✕✕ Recommended Road Closure

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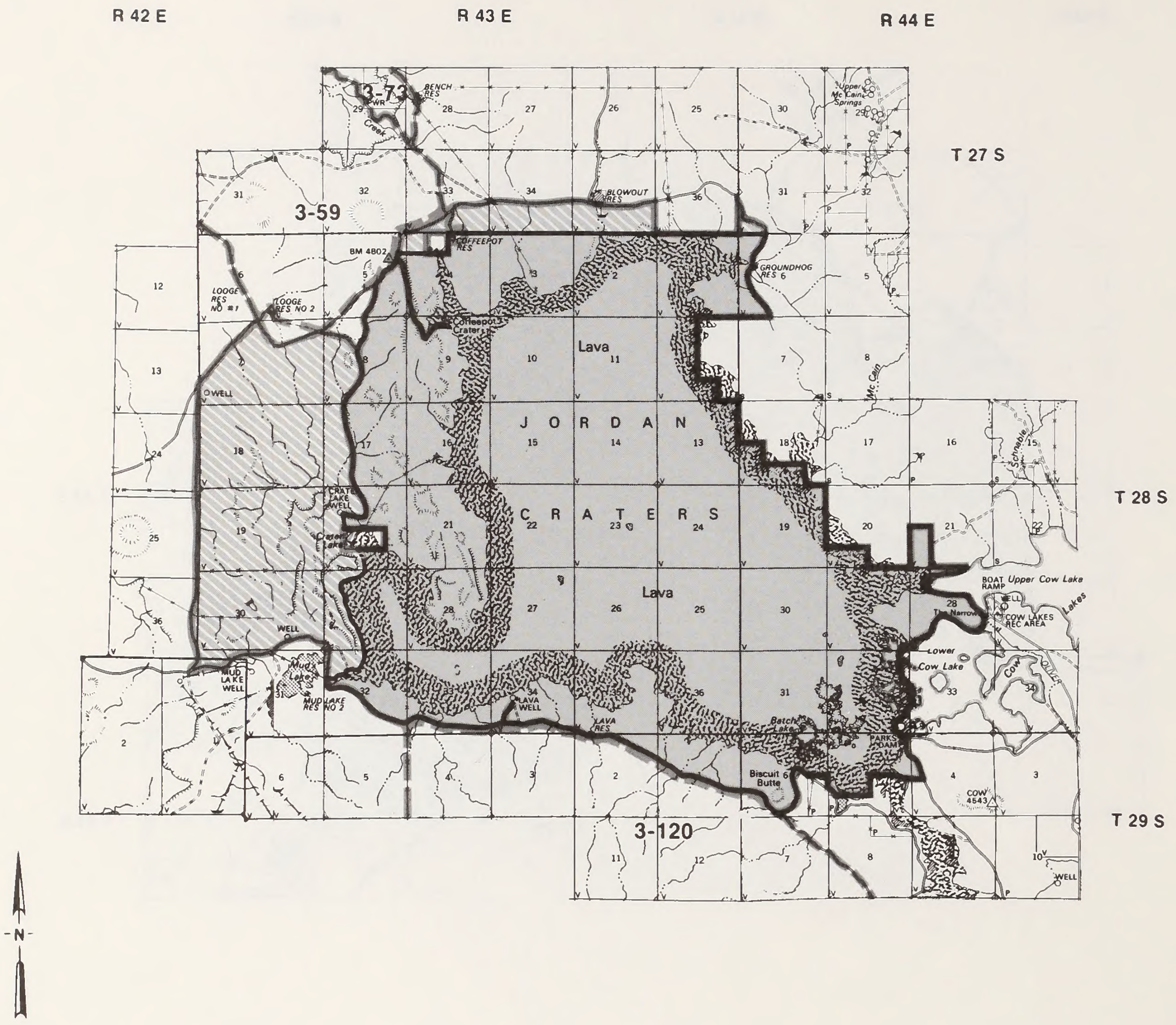
ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 4



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

▩ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

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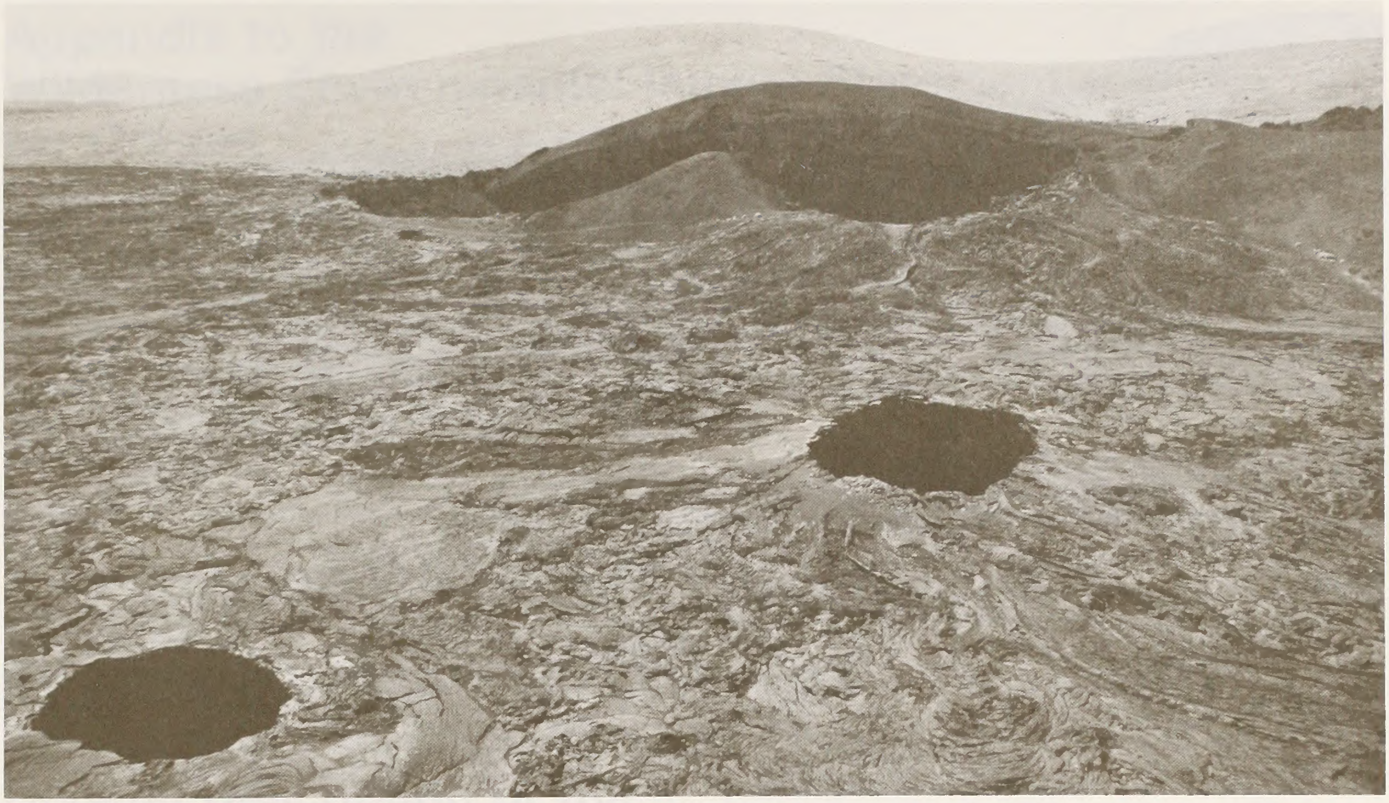
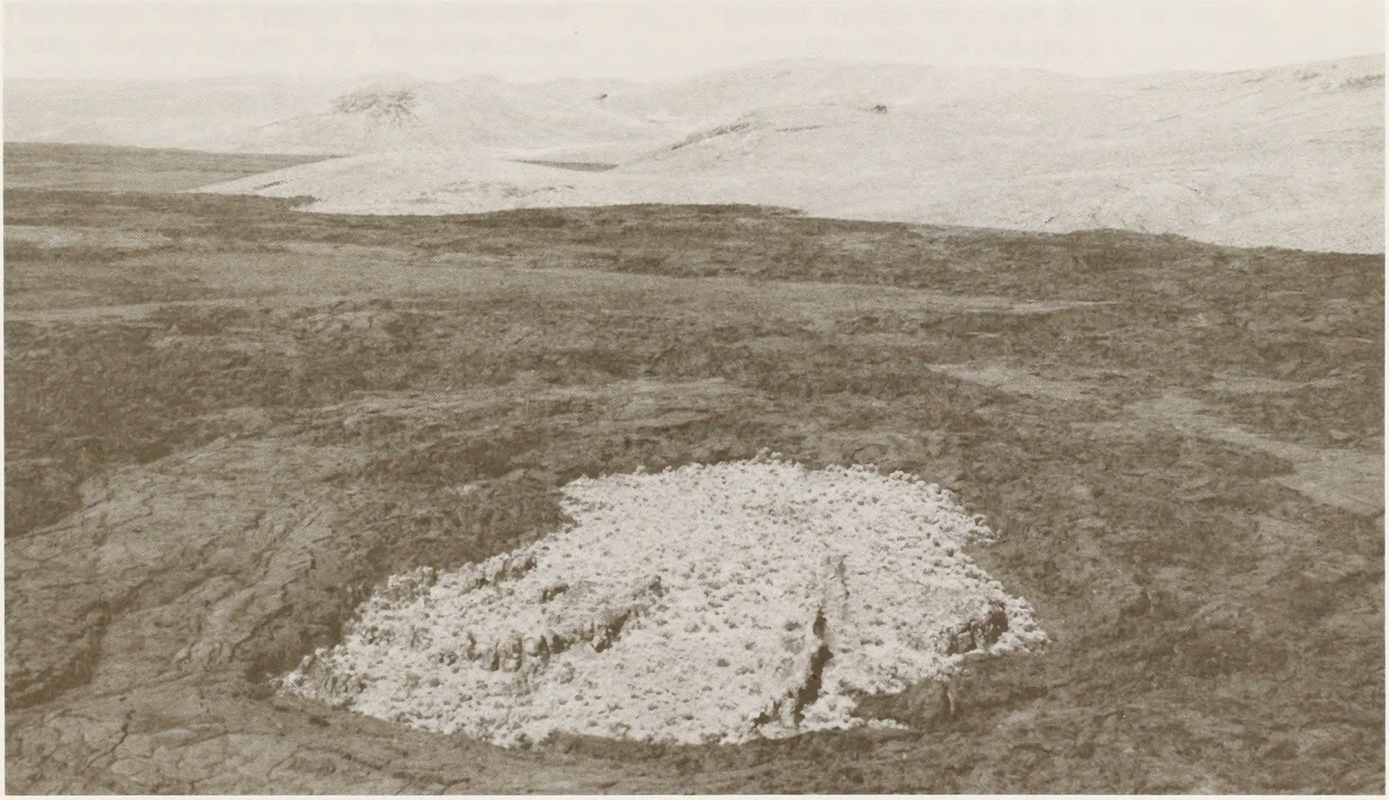
PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 5



Jordan Craters WSA, OR-3-128. North-central portion of the WSA looking east toward Coffeepot Crater across two collapsed lava tubes. Within area recommended suitable under the enhanced alternative and partial (preferred) alternative. September 1983.



Jordan Craters WSA, OR-3-128. Central portion of the WSA looking west across the kipuka toward the lightly-grazed ridge on the background. The foreground is suitable under the partial (preferred) alternative and enhanced alternative, whereas the background is suitable under the enhanced alternative only. September 1983.

Jordan Craters WSA, OR-3-128. Southeastern portion of the WSA looking west across the Batch Lake area toward Biscuit Butte (outside the WSA). Within area recommended suitable under the enhanced alternative and partial (preferred) alternative. September 1983.

Jordan Craters WSA, OR-3-128. North-central portion of the WSA looking west into Coffeepot Crater. Within area recommended suitable under the enhanced alternative and partial (preferred) alternative. A dead-end access road is visible on the slope in the background. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Trout Creek Mountains Group Wilderness Study Areas

Willow Creek (OR-3-152)
Disaster Peak (OR-3-153/NV -020-859)
Fifteenmile Creek (OR-3-156)
Oregon Canyon (OR-3-157)
Twelvemile Creek (OR-3-162)

General Description of the Study Areas

The Willow Creek, Disaster Peak, Fifteenmile Creek, Oregon Canyon, and Twelvemile Creek wilderness study areas (referred to collectively in this appendix as the Trout Creek Mountains group) are located in the Trout Creek Mountains in Oregon and Nevada. This eastern Oregon, northern Nevada mountain range straddles the Harney/Malheur County line in Oregon and the Oregon/Nevada state line.

The five WSAs are between 8 and 28 miles northwest of McDermitt, Nevada and U.S. Highway 95 (see map 1).

Together, the five WSAs include 175,120 acres of public land (see map 2). There are 7,480 acres of split-estate lands (federally managed surface, state or privately owned subsurface mineral rights) within the WSAs or between the boundaries of (that is, surrounded by) adjacent WSAs. They consist of eight 640-acre parcels and four irregular parcels of 720 acres, 650 acres, 550 acres, and 440 acres. All the split-estate lands are evenly dispersed in a checkerboard pattern across the group of WSAs.

Also within the WSAs or between the boundaries of adjacent WSAs are 2,620 acres of private land in 28 parcels of various sizes. All but three are 40-acre parcels. The three irregular parcels are 1,220 acres, 240 acres, and 160 acres. The majority of the private property is concentrated in the northwest side of the group of WSAs (including the 1,220-acre parcel) and the remainder are in the upper northeast portion of the group.

The WSAs are bordered to the north by grass seedings (bounded by fences) on public land, with three exceptions. A small private parcel lies along the northeast boundary, and to the northwest lie two split-estate parcels. The western boundary is basically a seeding edge in the north and BLM roads in the south. Exceptions are a BLM road at the extreme north end, rimrock along Whitehorse Creek Canyon (except for private property at the Sweeney Ranch), private property along Willow Creek, a seeding edge fence, and split-estate land along the central western boundary, a large parcel of private property at Sherman Field, and two parcels of split-estate land west of Sherman Field.

With a few exceptions, the southern boundary is basically formed by BLM roads along the west half and by natural features along the east half. The exceptions are a small parcel of private property and another of split-estate land in the central portion of this boundary. The eastern boundary is a series of seeding fences, roads, private and split-estate lands, a powerline, and water development projects.

Four BLM roads separate the WSAs. The northernmost road, approximately 5 miles long, crosses the northward extension of the WSAs from east to west roughly paralleling Antelope Creek. Another road, approximately 8 miles long, crosses the southwestern extension of the WSAs from north to south roughly paralleling Little Whitehorse Creek. The third road, approximately 25 miles long, crosses the southeastern portion of the group of WSAs from the west to the east, turns north, roughly paralleling Oregon Canyon, and joins the northernmost road mentioned above. The fourth road, approximately 5 miles long, crosses the southwestern portion of the WSA, roughly paralleling McDermitt Creek.

Ten dead-end roads penetrate different WSAs, forming part of their boundaries. The first, approximately two miles long, provides access to the split-estate parcel and Doolittle Cow Camp at the head of Doolittle Creek. The second penetrates 3 miles farther east along the ridge between the southern escarpment and the head of Oregon Canyon and ends at an overlook above the southeastern corner of the Trout Creek range. The third, a half mile long, provides access to Turner Reservoir.

Seven other dead-end roads penetrate the southwestern extension of the WSAs. (These are described in detail below in the discussion on the Disaster Peak WSA.) Another dead-end road penetrates the northeastern extension of the group. (It is described in detail below in the discussion on the Twelvemile Creek WSA.) The land adjacent to the boundaries of the Trout Creek Mountains group is public land, except for the split-estate and private lands previously mentioned. Lands to the east, north, and west of the WSAs are predominantly used for livestock grazing, and to the south for grazing and mining.

The five WSAs are comprised of the Trout Creek Mountains, an uplifted and tilted geologic block with a steep escarpment along the southern and eastern extent of the range. Within the portion of the WSAs south of the range, below the escarpment, lies the collapsed volcanic dome called the McDermitt Caldera. To the east lies the Quinn River Valley. West of the range is the Pueblo Valley. The range slants down to the north, draining into the Coyote Lake Basin playa. The erosion caused by this tilting has resulted in numerous semi-parallel canyons trending through the WSAs from the south to the northwest.

The escarpment through the WSAs is the divide between land-locked Coyote Lake Basin in Oregon and Humboldt Basin in Nevada and ranges roughly from 8,500 feet to 6,500 feet. The relatively high elevations cause enough year-round precipitation to support perennial streams and springs. This gives rise to groves of mountain mahogany, aspen, and willow, as well as abundant shrub species on the headwaters and canyon bottoms throughout the range.

The Willow Creek WSA contains 28,810 acres of public land, along with 880 acres of private land and 640 acres of split-estate land. It is approximately 12 miles long, running north to south, and ranges from 6 to 1.5 miles wide. The private and the split-estate land are in the southern half of the WSA. The WSA is bordered by private land, split-estate land, seedings, and BLM roads.

The WSA's diverse terrain ranges from gentle relief in the north and south to deep, wide canyons of sheer basalt rims and talus slopes in the center of the area.

The Disaster Peak WSA contains 30,490 acres of public land (17,290 acres in Oregon and 13,200 acres in Nevada). It has a very irregular horseshoe shape, approximately 10 miles long and 8 miles wide. Within the WSA is a 40-acre private parcel. In addition, 720 acres of split-estate are located along a dead-end road. The split estate is not inside the WSA because the WSA boundary extends along the dead-end road, but the parcel is surrounded by BLM land.

Seven dead-end roads penetrate the WSA; the longest, approximately 2 miles, provides access to the split-estate land from the western boundary. The remainder are all less than one mile in length. One enters the WSA from the south to old mining prospects. Another enters from the north, terminating at a reservoir in the northeast corner of the WSA. The remaining four enter from the east, ending at a reservoir, a fence, a canyon bottom and a weather recording station, respectively. The WSA boundary follows BLM roads and split-estate and private land boundaries.

The WSA sits along the northwest rim of the McDermitt Caldera, forming part of the divide that separates the Coyote Lake Basin from the Humboldt Basin. The landmark known as Disaster Peak is a large, symmetrical butte that is visible throughout the region. The westernmost portion of the WSA incorporates parts of an area known as The Granites, named after the abundance of very old granitic rock outcrops that appear at the base of the predominantly volcanic ridgeline.

The Fifteenmile Creek WSA contains 48,460 acres of public land. Approximately 14 miles long and 9 miles wide, the area is shaped like an arrowhead pointing north. A narrow protrusion extends one mile from the western boundary of the WSA to include some of the canyon and rims of Whitehorse Creek. Within the WSA are 1,930 acres of split-estate lands. In addition, 640 acres of split estate and 40 acres of private land are located along dead-end roads. The parcels are not inside the WSA because the WSA boundary follows the dead-end road, but the parcels are surrounded by BLM land. The boundary of the WSA follows a fenced seeding, BLM roads, private land, and split-estate land. A dead-end road, forming part of the boundary, extends 2 miles into the study area from the southern boundary road, through the split-estate section near that boundary. It serves as access to Doolittle Cow Camp on public land.

Topography of the WSA consists of long, deep, steep-walled canyons (mostly tributaries of Whitehorse Creek) separated by broad, smoothly rounded ridges. The canyon slopes are broken by rock rims, outcrops and scree slopes while the ridge tops are flat or gently rolling.

The Oregon Canyon WSA contains 40,400 acres of public land, and is approximately 13 miles long and 5 miles wide, except for an additional 5-mile-long and 2-mile-wide western protrusion along the southern end of the WSA. There are 1,920 acres (three separate sections) of split-estate lands in the WSA. The WSA is bordered by public lands, split-estate lands, and, for less than 2 miles, private land. The north, west and east boundaries generally follow fences and roads, while the south boundary follows natural features, such as rimrock ledges and drainage bottoms. A dead-end road from the western boundary road extends about 3 miles into the center of the WSA to provide access to the heads of several canyons and to viewpoints along the escarpment.

Topography in the WSA consists of a few long ridgelines, the deep Oregon Canyon and it's two steep-walled forks, and many relatively short and precipitous canyons which drain the eastern and southern slopes. The ridge tops are rounded, and slopes are broken by rock outcrops, rims and scree slopes.

The Twelvemile Creek WSA contains 26,960 acres of public land in a heart-shaped configuration. The WSA has one split-estate parcel of 440 acres and 6 parcels of private property totaling 360 acres (all but one are 40-acre tracts). A BLM road, a fenced crested wheatgrass seeding, and private and split-estate lands border the study area. Also, the area's eastern boundary is bordered by a powerline and a large brush control project. A dead-end road extends 1 mile into the southeastern corner of the study area from the southern boundary road to provide access to the ridgeline east of Twelvemile Creek.

The WSA consists of two fault block plateaus, steeply scarped on the east and sloping gently toward the northwest. Four major canyons originate near the southeastern edge of the study area and cut deeply as they radiate outward, in a fanlike array, to the north and northwest. They are steep-sided, edged with rimrock, and joined by many tributary drainages. The ridge tops are broad and flat to gently rolling.

Interrelationships

To the west of both Willow Creek and Disaster Peak WSAs lies Mahogany Ridge WSA (OR-2-77). A road separates it from the other WSAs.

Part of the Disaster Peak WSA overlaps into both BLM's Winnemucca District in Nevada, which refers to it as NV-020-859, and BLM's Burns District in Oregon. The portion in Nevada contains 13,200 acres.

The entire Oregon portion of the Trout Creek range is within an Oregon State Fish and Wildlife Department special deer management area. This area is currently being managed to control the number and sex of deer taken during hunting seasons, resulting in a more stable herd size and mix.

Portions of the WSAs overlap portions of the Whitehorse Basin Area of Critical Environmental Concern (ACEC). The ACEC was designated in 1983 to bring special management attention to the only known habitat for the Whitehorse cutthroat trout, a BLM sensitive species that is particularly adapted to the harsh desert environment. Special management to protect the fragile habitat and to preserve the gene pool for restocking includes:

- restricting or excluding livestock grazing where necessary, until riparian vegetation is established and naturally maintains itself,

- removing fish barriers,

- stocking fish in suitable habitat,

- constructing pool habitat,

- augmenting stream flow by constructing water retention structures and by protecting riparian vegetation from livestock and ORV use,

- attempting to acquire private land critical to habitat management, and

- manipulating cover and shade to maintain existing habitat.

This special management for the ACEC would continue to apply in the portions within the WSA whether or not the area was designated wilderness.

Issues

Issues relating to the WSAs were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSAs, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for these WSAs include:

- potential mineral development of split-estate lands and continued use and possible development of private inholdings. (This does not apply to the Oregon Canyon WSA which has no private inholdings.) (Effects of wilderness designation on private lands are discussed in the Statewide EIS volume.),

- exploration and development of the WSAs' mineral and geothermal potential, including development of existing mining claims for gold and semiprecious stones in some WSAs,

- harassment of wildlife and livestock and damage to vegetation and soil from ORVs (analysis showed that these impacts would be insignificant in relation to the alternatives analyzed),

- development of livestock and wildlife improvement projects,

- preservation and enhancement of the Whitehorse cutthroat trout populations,

- closure of dead-end roads in the WSAs,

- outside sights and sounds (affecting OR-3-157 and 162), and

- public access across private land (all WSAs).

Also raised as an issue was the possibility of combining the Trout Creek Mountains group and some non-WSA lands into a single wilderness area. In the Disaster Peak WSA, the effect of the WSA's configuration upon its manageability as wilderness was raised as an issue.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- preferred alternative
- no wilderness/no action

The Whitehorse Basin ACEC is in the portions recommended as suitable for wilderness under the all wilderness and preferred alternatives for the Willow Creek, Fifteenmile Creek, and Twelvemile Creek WSAs.

An enhanced wilderness alternative combining the Mahogany Ridge WSA (OR-2-77) with the five WSAs described in this appendix is not analyzed because it would not be feasible to close the road which divides Mahogany Ridge from the adjacent two WSAs. This road is necessary for both public use (access to private land, livestock management, hunting, etc.) and BLM use.

Separate enhanced wilderness alternatives for each WSA, in which the roads between WSAs would remain open, are not analyzed because the effects of such alternatives would not be substantially different from those analyzed in the all wilderness and preferred alternatives. The effects of leaving the roads open and designating the WSAs as separate wilderness areas are analyzed in the all wilderness alternative.

A partial alternative is not analyzed because there is no plausible way of resolving all conflicts between wilderness and other resource uses by recommending the areas with conflicts as nonsuitable for wilderness. Some manageability and resource conflicts are resolved in the preferred alternative. Resolving other conflicts by recommending portions as nonsuitable would not leave viable wilderness areas.

All Wilderness

Under the all wilderness alternative, each of the five WSAs would be recommended as suitable for wilderness and would be managed as separate wilderness areas (see map 2): 28,810 acres of the Willow Creek WSA, 30,490 acres of the Disaster Peak WSA (including 13,200 acres in Nevada), 48,460 acres of the Fifteenmile Creek WSA, 40,400 acres of the Oregon Canyon WSA, and 26,960 acres of the Twelvemile Creek WSA. The roads between the WSAs and dead-end roads into the WSAs would remain open.

For purposes of analysis, it is assumed that none of the private or split-estate inholdings would be acquired.

Preferred Alternative

Under the preferred alternative, portions of Willow Creek, Disaster Peak, Oregon Canyon and Twelvemile Creek WSAs and all of Fifteenmile Creek WSA would be combined and recommended suitable for designation as a single wilderness area: 12,810 acres in Willow Creek WSA; 28,890 acres in Disaster Peak WSA; 12,660 acres in Oregon Canyon; 24,160 acres in Twelvemile Creek; and 48,460 acres in Fifteenmile Creek WSA. This would involve a total of 126,980 acres of public land in the WSAs (including 12,300 acres in Nevada) (see map 3). An attempt would be made to acquire an additional 8,200 acres of split-estate (6,400 acres) and private (1,800 acres) inholdings and adjacent parcels, all in Oregon. These parcels could be acquired through purchase or exchange with willing landowners. An additional 980 acres of public land outside the WSAs would also be added to the suitable area recommendation; this land also is in Oregon.

Also, if landowners agreed, public access easements would be acquired across Sherman Field in the southwest portion of the recommended wilderness, the lower end of Oregon Canyon on the east side of the Trout Creek Mountains, and the lower end of Twelvemile and Whitehorse Canyons in the north end of the WSAs to allow legal public access to some of the area's major travel corridors.

If the acquisitions were successful, and the public land outside the WSA were added, total area recommended suitable under this alternative would be 136,160 acres.

Recommended as nonsuitable for wilderness would be 16,000 acres in the Willow Creek WSA, 1,600 acres in the Disaster Peak WSA (including 900 acres in Nevada), 27,740 acres in the Oregon Canyon WSA, and 2,800 acres in the Twelvemile Creek WSA (a total of 48,140 acres).

The four roads that separate the WSAs, totaling about 43 miles, would be closed. Much of the boundary of the suitable area under this alternative would follow the boundary of the WSAs. The following discusses exceptions in each WSA. These boundary segments would separate portions of the WSAs recommended as suitable from those recommended as nonsuitable.

The western boundary south of Whitehorse Butte in the Willow Creek WSA would follow a fenceline that extends to the bottom of the Willow Creek drainage. The boundary then would follow Willow Creek, private property, an existing way (a vehicle route established and maintained solely by the passage of vehicles), and a road between the Willow Creek and Disaster Peak WSAs. Land west of this line in the Willow Creek WSA would be recommended as nonsuitable for wilderness.

Three narrow extensions of the Disaster Peak WSA would be recommended as nonsuitable for wilderness. The recommended wilderness boundary would follow ways and fences across the base of the extensions.

In the Oregon Canyon and Twelvemile Creek WSAs, the recommended wilderness boundary would follow the top of the Trout Creek escarpment. Land south and east of the escarpment would be recommended as nonsuitable for wilderness.

In the Twelvemile Creek WSA, the wilderness boundary would follow a rim on the west side of Antelope Creek. Land west of the rim would be recommended as nonsuitable for wilderness.

No Wilderness/No Action Alternative

The no wilderness/no action alternative would recommend each WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development,

- continued restriction of vehicle use to existing roads and trails,

- development of wildlife and livestock improvement projects, including spring developments, fences, seedings, brush control, and riparian enhancement projects.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The five WSAs would be manageable as wilderness under the all wilderness alternative, but problems could be encountered in portions of the areas.

Owners of the mineral estate could explore for minerals on the split-estate inholdings, and if minerals were found they could be mined and access developed across public lands. Owners of private inholdings could also mine their lands or develop them in other ways which would adversely affect wilderness values on adjacent public lands. The private inholdings are used in much the same manner as the surrounding public lands, and there are no indications that the owners intend to change that use.

The split-estate inholdings are located a minimum of three miles from each other, and the distance separating the parcels would reduce the cumulative impact of any development which might occur.

Split-estate and private inholdings are concentrated in the southeast corner of the Twelvemile Creek WSA, and development of the inholdings could complicate wilderness management in that area.

Table 1. Summary of Proposed Management Under Each Alternative, Willow Creek (OR-3-152), Disaster Peak (OR-3-153), Fifteenmile Creek (OR-3-156), Oregon Canyon (OR-3-157) and Twelvemile Creek (OR-3-162) WSAs

Proposed Management	All Wilderness	Preferred	No Wilderness/ No Action
Acres Designated as Wilderness [1]	175,120	127,960	0
Acres Closed to ORVs by Wilderness Designation	175,120	127,960	0
Miles of Roads Closed	0	57	0
Miles of Ways Closed	115	87	0
Acres of Full Fee Estate Acquired [2]	0	1,800	0
Acres of Split Estate Acquired [2]	0	6,400	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	175,120	127,960	0
Structural Wildlife Projects Developed:			
Fences (miles)	0-10	0-10	10
Stream Channel Projects (numbers)[3]	0-1	0-1	1
Structural Livestock Projects Developed:			
Reservoirs & Waterholes (numbers)	0-2	1-2	2
Springs (number)	0-4	1-4	4
Fences (miles)	0-9.5	3-9.5	9.5
Vegetative Manipulation for Livestock:			
Brush Control without Seeding (acres)	0	0	3,550
Brush Control with Seeding (acres)	0	500	500

[1] Suitable acreage includes Nevada's Disaster Peak WSA (NV-020-859) totaling 13,200 acres under all wilderness and 12,300 acres under the preferred alternative.

[2] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[3] Involves placement of 75 boulder dams for Lahontan cutthroat trout.

The greatest concentration of private inholdings in the five WSAs is located in the west half of the Willow Creek WSA. The possibility of development of the inholdings in that area poses the most significant potential for management problems in the five WSAs.

Three small, narrow extensions of the Disaster Peak WSA would be difficult to manage as wilderness because developments and activities on adjacent private lands could adversely affect wilderness values on the extensions.

The preferred alternative would be more manageable as wilderness than the all wilderness alternative because areas with potential manageablility problems in the west half of the Willow Creek WSA and the narrow extensions of the Disaster Peak WSA would not be included in the wilderness.

Table 2. Summary of Environmental Consequences of Alternatives, Trout Creek Mountains Group (OR-3-152, 153, 156, 157, 162)

Resource or Activity	All Wilderness	Preferred Alternative	No Wilderness/No Action
Wilderness Values	Would add 175,120 acres to the NWPS as 5 separate wilderness areas: Willow Creek WSA - 28,810 acres of Great Basin Mountain Range ecosystems and features added to to NWPS. Vehicles restricted on 25 miles of ways. Area manageable as wilderness. Diaster Peak WSA - 30,490 acres added to NWPS. Vehicles restricted on 18 miles of ways. Area manageable as wilderness. Fifteenmile Creek WSA - 48,460 acres added to NWPS. Vehicles restricted on 40 miles of ways. Area is manageable as wilderness. Oregon Canyon WSA - 40,400 acres added to NWPS. Vehicle use restricted on 12 miles of ways. WSA is manageable as wilderness. Twelvemile Creek WSA - 26,960 acres added to NWPS. Vehicle restrictions on 20 miles of ways. WSA is manageable as wilderness. In general, naturalness improved because of less vehicle use on ways; Naturalness adversely affected if inholdings developed and access routes to inholdings developed. Opportunities for solitude adversely affected if minerals are developed, but improved due to closure of ways. Primitive recreation unchanged unless adversely affected by mining. Special wilderness features would be adversely affected if mineral development forces wildlife to relocate, degrades scenery, and pollutes water.	Would add 136,160 acres to NWPS, assuming 9,180 acres of private, split estate and public land added. Combines all of 4 and part of 1 WSA into a single wilderness area. Great Basin Mountain and Range ecosystem and features added to NWPS. In portion recommended suitable for wilderness, naturalness would improve due to revegetation of 87 miles of ways, 14 miles of dead-end roads, and 43 miles of common boundary roads. Reduces potential for adverse impacts from mineral development on mining claims, if claims were determined to be valid. In portion recommended suitable, solitude enhanced by less disturbance along ways and roads; provides larger area to disperse users and provide more secluded spots. Quality of primitive recreation opportunities in portion recommended suitable would improve because mining potential reduced, larger area, more challenge. In portion recommended nonsuitable for wilderness, wilderness values could be adversely affected by mineral development, particularly on steep slopes in Oregon Canyon and Twelvemile Creek WSAs and along stream in Willow Creek WSA. Grass seeding in nonsuitable portion of Twelvemile Creek WSA would reduce naturalness of area. Structural range developments could be constructed in nonsuitable portions without constraints to enhance wilderness values.	Naturalness adversely affected by development of all proposed livestock and wildlife projects, continued exploration and development of mineral resources, possibility of new roads and ways. Solitude and primitive recreation quality adversely affected by vehicle use.
Energy and Mineral Development	Development precluded on a total of 175,120 acres in five WSAs, including: Willow Creek WSA - 28,810 acres, including moderate potential minerals; Disaster Peak WSA - 30,490 acres, including moderate potential minerals; Fifteenmile Creek WSA - 48,460 acres, including moderate potential minerals; Oregon Canyon WSA - 40,400 acres, including moderate potential minerals; and Twelvemile Creek WSA - 26,960 acres, including moderate potential minerals.	Development precluded on 126,980 acres, plus an additional 9,180 acres if private and split-estate lands acquired and public land added. Includes moderate potential minerals.	No impact.
Vegetation	Vegetation preserved.	Vegetation preserved in suitable area. The 500-acre burn-and-seed would reduce vegetative diversity by reducing shrubs and forbs. The federal candidate species, and any OHNP species designated a BLM sensitive species, would be protected.	The 500-acre burn-and-seed and two other brush control projects (2,250 acres and 1,300 acres) would temporarily reduce vegetative diversity. The federal candidate species, and any OHNP species designated a BLM sensitive species, would be protected.
Wildlife	Wildlife habitat preserved. Stream habitat improvement projects might be allowed, improving habitat and increasing fish populations.	Same as all wilderness in suitable area. Land acquisitions would allow the possibility of stream enhancement projects on additional stretches of stream.	Stream habitat improvement projects would be constructed resulting in better habitat for fish and small population gains. Diversity of species might increase due to brush controls. Populations of wildlife not expected to change.

Livestock Grazing	Minor inconvenience to operators due to vehicle restrictions. Willow Creek WSA - One proposed spring and potential to change utilization patterns resulting in an increase of up to 25 AUMs might be foregone. Disaster Peak WSA - No significant impact. Fifteenmile Creek WSA - Two springs, one reservoir, two fences, and potential to change utilization patterns resulting in an increase of up to 285 AUMs might be foregone. A 1300-acre brush control resulting in an increase of 115 AUMS would be foregone. Oregon Canyon WSA - One fence, one reservoir, and potential to change utilization patterns resulting in an increase of up to 215 AUMs might be foregone. Twelvemile Creek WSA - Two fences, one spring, and potential to change utilization patterns might be foregone. A brush control and seeding project resulting in an increase of 315 AUMs would be foregone. A total potential increase of 430 to 1,095 AUMs might be foregone.	Greater inconvenience to operators due to motor vehicle restrictions than all wilderness. Willow Creek WSA - Allows spring development and corresponding change in utilization patterns, increasing forage by 25 AUMs. Disaster Peak WSA - No significant impact. Fifteenmile Creek WSA - Same as all wilderness. Oregon Canyon WSA - Allows one fence and one reservoir and the corresponding change in utilization patterns, resulting in an increase of 215 AUMs. Twelvemile Creek WSA - Allows a 500-acre seeding, one fence, and change in utilization resulting in an increase of 230 AUMs. One fence and one spring resulting in an increase of 140 AUMs might be foregone. Two brush control projects resulting in 205 AUMs would be foregone. A total of 320 to 625 AUMs might be foregone. Projects making 470 AUMs available would be realized.	All proposed projects allowed in all WSAs. A total increase of 1,095 AUMs would be realized.
Recreation Use	Slight inconvenience to vehicle-oriented recreationists due to way closures. Stream projects, if built, would increase fishing use slightly. No change in overall recreation use.	Access more difficult, greater inconvenience to vehicle-oriented recreationists than all wilderness. In nonsuitable portions, recreation patterns would not change unless range developments degrade natural features which make recreational activities attractive. This development may change patterns by allowing new activities or eliminating old ones. Stream projects, if built, would increase fishing slightly. Little change in overall recreation use.	Same as nonsuitable portions in preferred alternative. Stream projects would increase fishing use slightly. Overall, no significant impact.
Economic Value and Local Income	Decrease in economic value by $695 and increase in local personal income by $10,380 if proposed structural projects were allowed. Decrease in economic value by $2,496 and decrease in local personal income by $561 if no projects were allowed. The maximum increase in transportation costs to livestock operators would be $634.	Decrease in economic value by $974 and increase in local personal income by $12,149 if proposed structural projects were allowed. Decrease in economic value by $1,467 and increase in local personal income by $7,161 if structural projects were not allowed in the suitable area. The maximum increase in transportation costs to livestock operators would be $897.	Increase in economic value and local personal income by $1,773 and $17,856, respectively, from construction of all proposed projects.

Rationale for the Selection of the Preferred Alternative

The preferred alternative would preserve the excellent wilderness qualities of the combined WSAs. The benefits of preserving those values would outweigh the benefits of retaining options for development of the area. The area has a high degree of naturalness. Outstanding opportunities for solitude are available because of the combined area's large size, topographic and vegetative screening, and many travel corridors. Outstanding primitive recreation opportunities for the combined area include hiking, backpacking, camping, sightseeing, photography, bird watching, hunting, fishing and winter sports.

The preferred alternative would include the unique or special wilderness features of the combined area, including several impressive canyons. The Granites, Disaster Peak, massive fault blocks, a wide diversity of vegetation and wildlife, important riparian zones, a large population of deer, the Whitehorse cutthroat trout, outstanding scenery, a large number of cultural sites, and excellent opportunities for educational and scientific study.

Closing and rehabilitating roads would help reduce adverse effects upon the area's naturalness, solitude and primitive recreation opportunities. Increasing the size would lessen the influence of outside sights and sounds. Acquisition of the private land and the split mineral estate would eliminate the possibility of additional negative influences from access and development. Acquisition of easements would ensure legal access to some of the major trail heads.

The west half of the Willow Creek WSA and three narrow extensions in the Disaster Peak WSA are recommended nonsuitable for wilderness because of the potential manageability problems described in the previous section.

Land on the south and east sides of the Oregon Canyon WSA and on the east side of the Twelvemile Creek WSA are recommended nonsuitable for wilderness because developments and activities on lands outside the WSAs can be seen from those portions of the WSAs. The sight of the developments and activities reduces the apparent naturalness and opportunities for solitude. The benefits of keeping that area open to mineral exploration and possible development would outweight the benefits of preserving the limited number of wilderness values in the area. The area has moderate potential for mercury, uranium, gold and tin.

Land in the north part of the Willow Creek WSA is recommended nonsuitable as wilderness because the developments in that area reduce the area's apparent naturalness. Land in the northwest corner of the Twelvemile Creek WSA is recommended nonsuitable for wilderness because the benefits of increasing livestock forage by planting crested wheatgrass would outweight the benefits of preserving the limited wilderness values in the area.

Affected Environment

This section discusses only those activities or resources that influence the character of the study areas, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSAs are generally natural. Topography screens the signs of man throughout the WSAs. Nearly all the developments are in draws, in basins, or on ridgelines.

At lower elevations the terrain is more rolling, and less steep. In this topography, a development influences a larger area than the same type of development in the higher elevations, and a visitor is likely to see more than one development at one time. This is the case in the northwest extension of the WSAs between Little Whitehorse Creek and Willow Creek. Here the area is apparently natural, but a decline in the quality of the naturalness is perceptible because of the cumulative effect of multiple man-made features.

In contrast, developments in the southwest portion of the group of WSAs are just as near one another, but, because of the terrain, few of them can be seen from a single spot; many of the developments in that portion of the mountains would not be seen during a typical traverse of the area. One exception to the better screening at the higher elevations is near the south-central boundary, where there is a cow camp at the head of Doolittle Creek Canyon. Here the headwater basin is wide and shallow, and the buildings, corrals, access road, and garbage dump are obvious for 1/2 to 3/4 of a mile in all directions.

North of the WSAs lie rolling ridges of wheatgrass seedings with occasional roads, stock water developments, and distant ranches visible among them. Because of the terrain, these developments cannot be seen from much of the area within the WSAs.

Developments in the Quinn River Basin to the east of the WSAs consist of numerous agricultural fields, ranches, powerlines, pastures, fences, the community of McDermitt, and roads. Some of these lie as close to the WSAs as the foot of the escarpment and are nearly always visible to a visitor anywhere on the escarpment slope. The steepness of the escarpment blocks a view of the remainder of the mountain range. Because the influences are inescapable and the rest of the mountain range cannot be seen from much of the escarpment, the visitor's perception of the escarpment's naturalness is diminished.

The same situation occurs along the east half of the southern escarpment. Here the influences are largely related to mining instead of ranching. The west half of the southern escarpment is slightly influenced by distant ranching developments and activity but, as in the case of the northern boundary, the influences are too few and distant to have a substantial effect.

Specific developments within each of the WSAs are listed in table 3. Following is a discussion of the naturalness of each WSA.

Willow Creek WSA - The WSA is generally natural. The rugged terrain throughout the majority of the WSA has limited developments. Most are concentrated in the northern and southern portions of the WSA. Of the 21 interior developments, one way and one fence affect the central portion of the

Table 3. Man-Made Features and Percent of WSAs Influenced, [1] Trout Creek Mountains Group (OR-3-152, 153, 156, 157, 162)

Type	Willow Creek (3-152)	Disaster Peak (3-153)	Fifteenmile Creek (3-156)	Oregon Canyon (3-157)	Twelvemile Creek (3-162)	Totals
Ways - number	9	16	16	8	10	59
(miles)	(25)	(18)	(40)	(12)	(20)	(115)
Stock Water Projects	1	7	28	5	4	45
Fences	8	6	8	4	6	32
Exclosures/Corrals	3	0	0	2	0	5
Structures	0	2 [2]	1 [3]	1 [4]	0	4
Total Developments	21	31	53	20	20	145
Influenced Portion of WSA [5]	24%	26%	7%	9%	7%	14%
Total Acres in WSA	28,810	30,490	48,460	40,400	26,960	175,120

[1] The area of influence is an estimate of the acreage within the WSA from which the man-made features can be seen.

[2] One snow measurement station near Peak Canyon and one cabin located in northeast corner of WSA.

[3] Buildings, corrals, and dump collectively referred to as Doolittle Cow Camp.

[4] An abandoned irrigation ditch.

[5] This figure has been corrected for overlapping influenced areas; i.e., an area influenced by one or more imprints is counted only once.

WSA. The majority of the influenced area is in the northern extension of the WSA. Here the developments are numerous and close, and their influences are stronger due to the minimal screening. Outside sights and sounds have a minimal influence upon the WSA. They consist of the boundary roads and grazing management projects.

Disaster Peak WSA - The WSA is generally natural. The majority of the 31 internal developments are located in the northern and north-central portions of the WSA. Three fences and one snow measuring station are located in the southern region of the WSA. The developments in the north half are hidden from each other by topographic features, although they are relatively close. Outside sights and sounds include vehicle travel on boundary roads and dead-end access roads and ranching activities to the southeast. These intrusions are generally brief or very distant, and their influence does not penetrate far into the WSA.

Fifteenmile Creek WSA - This WSA appears natural as most of the area is devoid of signs of human activity. Many of the 53 interior imprints are unobtrusive because they are small and are effectively screened by the topography and vegetation. Not included in table 2 are numerous debris catcher dams constructed of woven wire and metal fence posts. These lie in some creek bottoms and are generally unnoticeable. Outside sights and sounds consist of seedings, ranch buildings, fences, water troughs, a way, and a reservoir. These developments are nearby but their effect is minor due to topographic and vegetative screening.

Oregon Canyon WSA - This WSA is in a highly natural condition. Large portions of the interior are devoid of developments, which are concentrated in the south-central portion of the study area. Most of the developments are hidden in draws along the south and eastern escarpments, or, in the case of the fencelines, along the top of the southern escarpment. Outside sights and sounds that influence the WSA include ranches, mines, transportation and power transmission routes, and the community of McDermitt. These developments are concentrated along the eastern and southern boundaries. They are highly visible from the study area's east and south slopes which constitute over half of the WSA. The influence of these developments diminishes the visitor's perception of the WSA's naturalness.

Twelvemile Creek WSA - This WSA is essentially devoid of man-made features, and most of it is therefore generally natural. The developments are spread evenly across the WSA, along ridgelines (in the case of ways and fences) and in some small tributary headwater basins above the main drainages. They are topographically hidden. Outside sights and sounds include ranches (with the associated roads, buildings, powerlines, and pastures), and some livestock projects such as seedings and reservoirs. These highly visible developments diminish the perception of naturalness along the eastern escarpment in the northwest corner of the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

All five WSAs offer outstanding opportunities for solitude. The size and configuration of the mountain range provide excellent opportunities for dispersed use. Visitors tend to use natural travel corridors along the bottoms of major canyons, easily accessible ridge tops, or the headwater basins. Topography and vegetation provide excellent screening in these high use areas, and opportunities for solitude are outstanding. The short tributary drainages into the main canyons provide visitors with ample opportunities to find sėclusion. Each WSA has 40 to 60 miles of canyons and tributaries.

Normally traffic is light and irregular on the boundary roads and only affects opportunities for solitude in adjacent areas for brief periods. However, during the deer hunting season, traffic usually increases and the presence of other visitors becomes significant. These activities reduce the opportunities for solitude along the WSAs boundaries during this period.

Opportunities for solitude are limited in the three small extensions of the Disaster Peak WSA, between the numerous private property parcels along the west side of the Willow Creek WSA, and in the small extension in the very northwest part of the Willow Creek WSA.

Opportunities for solitude in the specific WSAs are discussed below:

Willow Creek WSA - Canyons and tributaries as well as a patchwork of mountain mahogany, aspen, and riparian systems of willow and brush combine with the unconfining shape and size of the WSA to offer the visitor numerous opportunities to find a secluded spot. However, the numerous private inholdings across the southwestern quarter of the WSA create corridors of public land that are 1/2 to 1 mile wide and therefore lessen the opportunities for a visitor to find solitude. Outside sights and sounds are brief or distant and do little to degrade the sense of solitude.

Disaster Peak WSA - Along with canyons and tributaries, this WSA has areas of vegetation that are quite extensive and almost inpenetrable; but they are crossed by numerous game and cattle trails which allow access to enclosed clearings and springs. The WSA's size does not restrict visitor use patterns except for three exceptions. A mile-wide extension of the WSA just west of Sherman's Field could cause frequent contact between visitors, thus reducing opportunities for solitude. The southernmost extension and a portion of the westernmost extension of the WSA are narrow and have open slopes with low brush cover. Except for these three narrow extensions, outside sights and sounds are too brief and distant to infringe on the opportunities for solitude in the WSA.

Fifteenmile Creek WSA - In addition to canyons and tributaries, thickets of mountain mahogany and aspen in the headwater basins provide dense screening in many locations. Downstream, the twisting and heavily vegetated riparian areas in the canyon bottoms also provide excellent screening. Outside sights and sounds include vehicle traffic on boundary roads and the Doolittle Cow Camp road. These limit opportunities for solitude along narrow strips adjacent to the roads.

Oregon Canyon WSA - Most of the canyons and tributaries are short headwater drainages to larger systems outside the WSA. Ridgetops in the study area are generally quite open. However, they provide some topographic screening and pockets of vegetative screening. The rough, twisting and heavily vegetated canyon bottoms contain excellent topographic and riparian vegetative screening. The short, steep canyons along the eastern and southern edge of the WSA would receive less use than the rest of the WSA and therefore would offer excellent opportunities to find a secluded spot if it were not for the influence of outside sights and sounds. Ranching operations, mineral exploration and transportation activities in the lowlands to the south and east of the WSA limit opportunities for solitude on the slopes. The sights and sounds are screened by topography and vegetation in some locations, particularly within the deeper and more sinuous side drainages. However, the activities could be seen or heard from most of the east and south escarpments.

Twelvemile Creek WSA - Numerous, very dense thickets of brush and groves of mountain mahogany and aspen grow in the headwater basins and upper ridgelines. Riparian vegetation provides much less screening in the lower drainages. The 1/4-mile wide westernmost extension of the WSA contains low rolling hills. Because of the configuration of this section, visitors would be confined and their opportunities for solitude would be lessened. Outside sights and sounds include ranching activities along the northern and eastern edges of the study area. The effects diminish with distance and do not penetrate very far into the area from the north, but the influence on the eastern escarpment is much more noticeable and lessens the opportunities for solitude along these slopes. Traffic on the boundary and dead-end roads on the south and west influence narrow adjacent strips of the WSA.

Primitive and unconfined types of recreation opportunities are outstanding in all the WSAs of the group. Table 4 lists outstanding primitive recreation opportunities available in each WSA.

The land and lifeforms in the study area provide excellent opportunities for primitive and unconfined recreation. The major canyons provide many hiking and backpacking routes which vary in distance and difficulty. Water and campsites along these routes are abundant.

A variety of plant and wildlife species, interesting geologic formations, and panoramic desert vistas provide attractions for sightseers, birdwatchers and photographers. The gentle ridgetops and consistent snowpack on the higher ridges provide good conditions for cross-country skiing and snow shoeing. Trophy mule deer and other game species are available and are hunted with a high degree of success. Native trout found in the pools and beaver ponds of several major streams provide sport for the dedicated angler.

Portions of the WSAs do not provide outstanding opportunities for primitive and unconfined recreation. These portions include the open slopes of the southernmost and westernmost extensions of the Disaster Peak WSA and the westernmost extension and the eastern escarpment of the Twelvemile Creek WSA.

Special Features

The following special wilderness features occur in all the WSAs:

Geologic Features - The andesite, rhyolite, and dacite flows of the Trout Creek formation provide the professional and amateur geologist an opportunity to study the overlying volcanics and the sedimentary leaf-bearing beds underneath. Each WSA has geologic landmarks, such as Disaster Peak, Whitehorse Canyon, and the escarpments along the south and east sides of the mountains. These features are characteristic of the tilted fault-block mountains of the Basin and Range Physiographic Province in southern Oregon.

Plants - Six plant species of special interest occur in the WSAs. (The Vegetation section further discusses these species.) There is a greater variety of plants in the mountains than is the case for most of southeastern Oregon.

Animals - The study area contains excellent desert bighorn sheep habitat, and the State of Oregon is considering reintroduction of the animals.

The Willow, Little Whitehorse, and Whitehorse Creek drainages contain a native population of Whitehorse cutthroat trout, one of the few remaining genetically pure strains of native trout species left in the Pacific Northwest. The species has been introduced into the adjacent Antelope Creek, which now includes a few small, year-round pools that harbor a self-propagating population. The species is considered sensitive by BLM and the American Fisheries Society and a "species of concern" by the State of Oregon. The genetic adaptations of this species are valuable to fisheries biologists

Table 4. Outstanding Primitive Recreation Opportunities, Trout Creek Mountains Group (OR-3-152, 153, 156, 157, 162)

Primitive Recreation Opportunity	Willow Creek (3-152)	Disaster Peak (3-153)	Fifteenmile Creek (3-156)	Oregon Canyon (3-157)	Twelvemile Creek (3-162)
Day hiking	X	X	X	X	X
Backpacking	X	X	X	X	X
Camping	X	X	X	X	X
Hunting	X	X	X	X	X
Sightseeing	X	X	X	X	X
Photography	X	X	X	X	X
Bird Watching	X		X	X	
Fishing	X	X	X	X	
Winter Sports		X	X	X	

- (x denotes opportunity is available)

seeking to reintroduce trout into harsh desert stream environments. The species may also prove important in the interpretation of the biogeographical history of the Great Basin and the Columbia plateau. (See Wildlife section for more information.)

Another species, the Lahontan cutthroat trout, is a federally listed endangered species native to the Lahontan Basin (which is part of the Quinn and Humboldt Basins). Hybrids of Lahontan cutthroat and rainbow trout have been found in McDermitt Creek, Sage Creek, Line Creek and the forks of Oregon Canyon. Fisheries biologists believe it possible, but not likely, that pure Lahontan cutthroats still survive in the McDermitt Creek system. The Lahontan redside shiners that are also found in these streams are at the northernmost extent of their range. (Also discussed further in Wildlife section.)

Three large predators may be found in this area: the coyote, bobcat and cougar. Although rarely seen, cougars have been observed along Little Whitehorse Creek.

Mule deer habitat is excellent and the animals are numerous.

The diversity of species is perhaps the area's most significant wildlife characteristic. This diversity is enhanced by the natural communities that range from semi-arid sagebrush desert to stream and riparian habitats.

Ecological Relationships - The area contains an unusually wide variety of environmental conditions that allow for a corresponding diversity of plant and animal life. The elevation ranges offer the opportunity to study a diverse high-desert ecosystem. The aquatic and riparian habitats found along the streams provide a dramatic contrast to the surrounding desert environment. The complexity and diversity of the natural communities are increased by the presence of the perennial streams. Lands along streams support organisms capable of living in the transitional area between the creeks and the arid conditions of the desert. The trout offer an excellent opportunity to study the adaptation of a unique species.

Features Specific to Certain WSAs - Two special wilderness features occur in some WSAs but not all; these are outstanding scenic quality and cultural resources.

The Willow Creek, Disaster Peak and Fifteenmile Creek WSAs have outstanding scenery and contain archeological sites. The Willow Creek and Disaster Peak WSAs also contain historic sites.

The Oregon Canyon WSA offers outstanding scenery in the inner canyons but not on the outer slopes of the escarpment. The WSA contains prehistoric and historic sites (discussed in Cultural Resources section).

The Twelvemile Creek WSA does not offer outstanding scenery. There is a moderate chance that the area contains archaeological sites. (See Cultural Resources section.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, all of the WSAs in the Trout Creek Mountains group lie within the Intermountain Sagebrush Province; the potential natural vegetation is sagebrush steppe. In addition, the potential natural vegetation for portions of the Willow Creek and Twelvemile Creek WSAs is saltbush-greasewood.

Table 5 identifies the plant communities listed in the Basin and Range section of the Oregon Natural Heritage Plan and found in the WSAs.

Boise, Idaho, and Reno, Nevada, are standard metropolitan statistical areas with populations over 100,000 within five hours' driving time of the WSAs.

Energy and Mineral Development

The energy and mineral resources of the study areas were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment sampling by the Oregon Department of Geology and Mineral Industries (DOGAMI) and by Barringer Resources, Inc., under a BLM contract. Barringer Resources, Inc., evaluated the energy and mineral resources of the part of the Disaster Peak WSA that lies in Nevada.

Technical details of the evaluation are incorporated in a report titled "Geochemical and Geostatistical Evaluation of Wilderness Study Areas, Winnemucca

Table 5. Oregon Natural Heritage Plan Plant Communities Found in the Trout Creek Mountains Group (3-152, 153, 156, 157, 162)

ONHP Plant Community	Willow Creek (3-152)	Disaster Peak (3-153)	Fifteenmile Creek (3-156)	Oregon Canyon (3-157)	Twelvemile Creek (3-162)
Low Sagebrush/ Idaho Fescue	X	X	X	X	X
Low Sagebrush/ Bluebunch Wheatgrass	X	X	X	X	X
Big Sagebrush/ Bluebunch Wheatgrass	X	X	X	X	X
Big Sagebrush/ Idaho Fescue	X	X	X		X
Shadscale/Spiny Hopsage/Bud Sage Common Complex	X				X
Mountain Mahogany Community in Southern Basin and Range	X	X	X		
Low Sagebrush/ Sandberg's Bluegrass	X	X		X	

(X denotes plant community occurs)

District, Northwest Nevada." DOGAMI evaluated the energy and mineral potential of the part of the WSAs that lie in Oregon. Technical details of the evaluation are incorporated in a report titled "Geology and Mineral Resources of 18 BLM Wilderness Study Areas, Harney and Malheur Counties, Oregon." These geochemical surveys are the basis for the metallic minerals rating of this evaluation. Using the DOGAMI and Barringer reports, including a heavy minerals analysis from Barringer in September 1984, the study areas were re-evaluated by BLM geologists.

The WSAs have been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Because of the geologically recent volcanism and above-normal heat flow, the area is generally considered favorable for thermal waters for low-temperature, direct-use heat application. Smaller areas within this region are also potentially favorable for high-temperature geothermal resources. None have been identified within the WSAs. The oil and gas potential largely depends on the presence or absence of the suitable marine rocks at depth, but no test drilling has been done.

The mineral potential classifications for each WSA are shown in table 6. Map 4 shows the portions of the WSAs rated moderate (medium) for certain minerals.

There has been major production of mercury in Nevada, just southeast of the WSAs, and in the same vicinity a large uranium and associated lithium deposits have been discovered. Uranium deposits have also been mined in Nevada 10 miles southwest of the WSAs. In addition, hot springs occur in both of the calderas where ring-fracture systems are near vertical and deep seated. These fractures might provide the pathways for geothermal fluids.

The WSAs lie in the Trout Creek Mountains which are a part of a broad uplifted area in the northern part of the basin and range structural province of the Great Basin. All of the exposed formations are young volcanic rocks consisting of lava flows and overlying ash-flow sheets with occasional domes and extrusive masses. Two extinct volcanic features, the McDermitt Caldera to the south and the Whitehorse Caldera to the northwest, have influenced the geologic characteristics in the WSAs. These geologic conditions have contributed to the formation of several mineral occurrences.

In the Willow Creek WSA, forty-three geochemical samples were taken and analyzed by DOGAMI

Table 6. Classification of Energy and Mineral Potential, Trout Creek Mountains Group (3-152, 153, 156, 157 and 162)

Commodity	Area	Classification Level	Confidence Level
Metals			
Silver	Part of 3-152 [1], 3-156 [1], 3-162	3	C
	Rest of 3-152, 3-153, 3-156	2	C
Mercury	3-152, part of 3-156 [1], part of 3-157 [1]	3	C
	Rest of 3-156	3	A
	3-153, rest of 3-157, 3-162	2	C
Gold	Part of 3-153 [1], 3-162, part of 3-157 [1]	3	C
	3-152, rest of 3-153, 3-156 rest of 3-157	2	C
Beryllium	Part of 3-153 [1]	3	C
	Rest of 3-152, 3-153, 3-156, 3-162	2	C
	3-157	2	B
Tin	Entire area (all 5 WSAs)	2	C
Geothermal	Entire area (all 5 WSAs)	3	B
Uranium/thorium	Parts of 3-156 [1], 3-157 [1], and 3-162 [1]	3	C
	3-152, 3-153, rest of 3-156, rest of 3-157, rest of 3-162	2	C
Coal	Entire area (all 5 WSAs)	1	C
Oil/Gas	Entire area (all 5 WSAs)	2	B
Tar Sands/Oil Shale	Entire area (all 5 WSAs)	1	C
Limestone	Entire area (all 5 WSAs)	1	C
Bentonite	Entire area (all 5 WSAs)	1	C
Diatomite	Entire area (all 5 WSAs)	2	B
Zeolites	Entire area (all 5 WSAs)	3	A
Lithium	Entire area (all 5 WSAs)	3	A

[1] See map 4

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

which is approximately one sample per 1.1 square miles. The sampling results showed higher than normal values for beryllium, silver, mercury and tin. There are no other known mineral occurrences in the WSA. Private industry and DOGAMI comments have also indicated geologic favorability for gold, silver, lithium, zeolites and pumice. Either all or part of the WSA is considered to be moderately favorable for beryllium, silver, mercury, and geothermal resources. Of the 11 strategic and critical minerals sampled by DOGAMI, only beryllium and mercury were determined to have a moderate potential.

There were no geothermal or oil and gas leases and no mining claims in the Willow Creek WSA as of January 1, 1984.

The entire Disaster Peak WSA is rated moderately favorable for geothermal resources and lithium, and portions are moderately favorable for gold and beryllium. Beryllium is the only strategic commodity that has moderate favorability in the WSA. There were no geothermal or oil and gas leases in the study area as of January 1, 1984. The study area contained 14 mining claims in Oregon and four mining claims in Nevada as of January 1, 1984. The Oregon mining claims are associated with semiprecious stones; the Nevada claims are associated with gold.

In the Fifteenmile Creek WSA, eighty-one geochemical samples were taken and analyzed by DOGAMI which is approximately one sample per 0.9 square miles. The sampling results showed higher than normal values for mercury, uranium and silver. There are no other known mineral occurrences in the WSA. Private industry and DOGAMI comments have also indicated geologic favorability for gold, silver, zeolites and lithium. Either all or part of the

WSA is considered to be moderately favorable for mercury, uranium and tin and geothermal resources. Of the 11 strategic and critical minerals and metals sampled by DOGAMI, mercury is the only one determined to have a moderate potential.

There were no geothermal or oil and gas leases and no mining claims in the study area as of January 1, 1984.

In the Oregon Canyon WSA, sixty-five geochemical samples were taken and analyzed by DOGAMI which is roughly one sample per square mile. The sampling results showed higher than normal values for gold and mercury in parts of the study area. There are no other known mineral occurrences in the WSA. Private industry and DOGAMI comments have also indicated moderate geologic favorability for gold, mercury, uranium, lithium and zeolites. Mercury is the only strategic and critical mineral that has moderate favorability.

There were no oil and gas leases in the WSA as of January 1, 1984. There is one geothermal lease that lies partially in the WSA (1,862 acres). Oregon Canyon WSA has 190 mining claims. These mining claims are associated with semiprecious stones and uranium.

In the Twelvemile Creek WSA, eighty-five geochemical samples were taken and analyzed by DOGAMI which is approximately one sample per 0.5 square mile. Private industry and DOGAMI comments have indicated geologic favorability for zeolites. Either all or part of the WSA is considered to be moderately favorable for gold, silver, uranium, lithium and zeolites. There were no oil and gas or geothermal leases and no mining claims in the WSA as of January 1, 1984.

Vegetation

The amount and types of vegetative communities present in each WSA, as well as the overall ecological successional stage are shown in table 7.

Six plant species of special interest (mentioned in the Special Features section) occur in the WSAs.

Five of these are on List 2 of the Oregon Natural Heritage Plan's "Rare, Threatened and Endangered Plants and Animals of Oregon": *Allium bisceptrum* (twincrest onion) and *Ranunculus Andersonii* (Anderson's buttercup), which occur in Oregon Canyon and Twelvemile Creek WSAs; *Allium Lemmonia* (Lemmon's onion) and *Melica stricta* (rock oniongrass), which are found in the Oregon Canyon WSA; and *Symphoricarpos longiflorus* (long-flowered snowberry), which is found in the Fifteenmile Creek WSA.

The sixth species is a candidate for federal listing as threatened or endangered, *Collomia macrocalyx* (bristle-flowered Collomia), which is found in Oregon Canyon WSA.

Plant communities in the WSAs are typical of sagebrush grass ecosystem, with low sagebrush dominant on the more shallow and rocky soils and Wyoming big sagebrush dominant on the deeper soils. A wide variety of other plant species are also found here.

In the Willow Creek WSA grasses such as Sandberg's bluegrass and Thurber's needlegrass and forbs, such as lupine, arrowleaf balsamroot and phlox, are common. Sedges and rushes are found in wet areas and rose and currant are found along creek bottoms. Mountain mahogany is found in both open and dense stands while aspen stands are found at the head of drainages.

In the Disaster Peak WSA such species as hawksbeard, locoweed and Indian paintbrush are present as well as nettles, aquatic buttercup and monkey flower along the creek bottoms. Grasses include cusick bluegrass and mountain brome. Shrubs include bitterbrush, snowberry, serviceberry and snowbrush. Willows, roses, currants, rushes and sedges are prevalent along drainage bottoms. Aspen groves are found in headwater basins and at upper elevations while alders and cottonwoods are found along streams at the lower elevations.

In the Fifteenmile Creek WSA forbs such as hawksbeard, lupine and arrowleaf balsamroot, and shrubs such as bitterbrush, snowberry and snowbrush are common. Willows, roses, currants and basin big sagebrush are found along the bottom of drainages. The most common tree species is mountain mahogany, with aspen also common along some drainages.

In the Oregon Canyon WSA there are meadows of sedges and wildflowers, stands of brush such as mountain mahogany, and small aspen groves.

Plants in the Twelvemile Creek WSA include: grasses such as giant wildrye, Thurber's needlegrass and Sandberg's bluegrass; forbs such as arrowleaf balsamroot, locoweed and phlox; and

Table 7. Plant Communities and the Overall Ecological Successional Stages of the Trout Creek Mountains Group (3-152, 153, 156, 157, 162)

	Percent of WSA Containing Specified Community					
Vegetative Community	**Willow Creek WSA**	**Disaster Peak WSA**	**Fifteenmile Creek WSA**	**Oregon Canyon WSA**	**Twelvemile Creek WSA**	**Total for All 5 WSAs [1]**
Wyoming Big Sagebrush/ Bluebunch Wheatgrass	23	17	35	15	20	23
Wyoming Big Sagebrush/ Idaho Fescue	15	0	20	0	23	12
Wyoming Big Sagebrush/ Squirreltail	0	21	0	0	0	4
Wyoming Big Sagebrush/ Thurber's Needlegrass	0	11	0	0	0	2
Wyoming Big Sagebrush/ Giant Wildrye	0	10	0	0	0	2
Low Sagebrush/ Bluebunch Wheatgrass	10	14	10	32	15	17
Low Sagebrush/ Idaho Fescue	33	11	30	44	40	32
Low Sagebrush/ Sandberg's Bluegrass	0	5	0	9	0	3
Mountain Big Sagebrush/ Idaho Fescue	5	10	0	0	0	3
Mountain Mahogany/ Idaho Fescue	2	1	5	0	0	2
Shadscale/Indian Ricegrass	12	0	0	0	2	2
Percent of WSA Exhibiting Specified Ecological Successional Stage						
Early Seral [2]	17	1	5	10	0	7
Middle Seral	79	69	85	33	60	65
Late Seral	4	30	10	57	40	28

[1] Summation may not equal 100 due to rounding.

[2] Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.

shrubs such as bitterbrush, snowberry and squaw currant. Dense thickets of snowbrush are found at the southern end of the WSA, while mountain mahogany is widely scattered. Drainages with perennial water sources have rushes, nettles, roses and serviceberry, and many drainages have stands of quaking aspen and willows. Thickets of sagebrush, rabbitbrush and roses grow so high (6-8 feet tall) and dense in some drainages that they impede animal movement.

Wildlife

The WSAs are comprised of some of the most outstanding and diverse wildlife habitat in southeastern Oregon. The 4,000- to 8,000-foot elevations afford excellent habitats for a wide diversity of vegetative communities. Aspen groves are frequent and provide habitat diversity for tree-dependent wildlife. Extensive stands of mountain mahogany, buckbrush, bitterbrush and limited stands of alder and willow provide abundant cover and forage throughout the canyons. In contrast, windswept ridges are vegetated with low growing sagebrushes intermixed with a rich stand of perennial grasses and forbs. An excellent mixture of food, cover and water for wildlife is present throughout the majority of the study areas.

A corresponding variety of wildlife inhabit this area of rugged topography. Beaver are common along sections of perennial streams. A combination of annual heavy cattle grazing and felling of the larger aspen, cottonwood, alder, and willow by beaver has left a significant portion of the riparian plant community at much less than optimum condition; the continuous browsing of new shoots does not allow the re-generation of trees. The loss of streamside vegetation drastically alters the stream habitat.

Several streams within the WSAs contain naturally reproducing populations of trout. In the Disaster Peak WSA, brook and rainbow trout are found in the headwaters of the Kings River. In the Disaster Peak and Oregon Canyon WSAs, introduced rainbow trout have hybridized with native Lahonton cutthroat trout and inhabit favorable sites (especially beaver ponds). They are now common in the headwaters of the forks of McDermitt, Sage and Line Canyon Creeks and the forks of Oregon Canyon. The Lahonton cutthroat trout is a federally listed threatened species native to the Lahontan and Quinn Basins and pure Lahontan cutthroat may still survive in the Disaster Peak WSA.

The upper sections of all six streams provide valuable trout spawning areas and rearing habitats. The Whitehorse trout, a unique subspecies of cutthroat trout, is found only in the streams in the Whitehorse Basin. Within the Willow, Fifteenmile and Twelvemile Creek WSAs, the trout are found in Little Whitehorse, Willow, Whitehorse, Fifteenmile, Doolittle, and Antelope Creeks. The Whitehorse trout is one of the few remaining genetically pure strains of native trout in North America. Elsewhere, most native species have been eliminated through habitat degradation or through competition and hybridization with introduced trout species.

The Whitehorse cutthroat trout is found primarily in the canyons and lower slopes. Warm summer temperatures and dessication restrict its use of the lower portions of the stream and some sections of the headwaters. Removal of vegetation and increased siltation have caused a decline in the available habitat; the stream is currently more susceptible to damage during floods and droughts. Fortunately the Whitehorse cutthroat trout, like many other species of trout that inhabit isolated desert streams in the western U.S., have been remarkably resistant to poor habitat conditions.

To protect riparian vegetation from livestock and thus enhance the quality of trout habitat, habitat improvement projects are proposed for the Whitehorse Basin ACEC, including boulder placement to create approximately 75 pools and additional stream fencing (up to 10 miles total) where grazing systems fail to protect important riparian areas. Recent fencing of selected reaches of stream by BLM is gradually improving the riparian habitat. About 6 miles of Willow Creek and 4 miles of Little Whitehorse Creek have been fenced and 49 debris catcher dams have been constructed in Whitehorse, Fifteenmile and Doolittle Creeks.

The excellent quality mule deer habitat within the WSAs is a nearly ideal mix of forage, cover and water. The rugged topography affords a variety of sites suitable for upland browse and cover plants, such as mountain mahogany, bitterbrush, and quaking aspen. Browse forage is abundant throughout the majority of the area. Consequently mule deer are common in much of the area.

Antelope utilize the low sagebrush ridges and plateaus. Populations appear to be stable at less than 100 head.

A wide variety of upland bird species also inhabit the area. Sage grouse and horned larks inhabit the open ridges and areas of low-form sagebrush. Mountain meadows, essential for high quality sage grouse habitat, have decreased largely due to concentrations of cattle. Chukar are common throughout the canyons where suitable talus slopes occur near sources of water.

Livestock Grazing

As part of the ongoing livestock management activities occurring on lands both inside and outside the WSAs, some changes are being implemented in distribution of AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month). A WSA usually lies within different pastures of several allotments. An AUM redistribution in an allotment may change the allocated forage in the pastures which overlap the WSA.

Table 8 summarizes the existing and potential livestock use by allotment in the WSAs.

Existing livestock projects in the WSAs are listed among the man-made features in table 3.

Table 9 shows the number and types of proposed range improvements for all the WSAs. Also included on this table are the benefit/cost ratios for the different types of projects.

Vehicle use for livestock management is often on an as-needed basis which changes by operator, location, and season. The following discusses vehicle use by livestock operators in each WSA and includes use of boundary roads, if they are between two WSAs, and dead-end roads inside a WSA.

Willow Creek WSA - Some vehicle use occurs along the southern and eastern boundaries of the WSA.

Table 8. Existing and Potential Livestock Use, Trout Creek Mountains Group (OR-3-152, 153, 156, 157, 162)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs)
Willow Creek WSA					
Fifteenmile 1201	25,118	04/01-10/15	1	710	0
Willow Creek 1204	5,030	04/01-09/30	26	2,886	0
Trout Creek Mtn. 6015	14,357	07/01-09/30	2	300	25
Totals				3,896	25
Disaster Peak WSA					
Fifteenmile 1201	25,118	04/01-10/15	1	2,464	0
Willow Creek 1204	5,030	04/01-09/30	4	804	0
Zimmerman 1203	5,730	03/01-08/10 10/01-11/30	25	1,600	0
Trout Creek Mtn. 6015	14,357	07/01-09/30	2	200	0
Kings River 0048	15,575	06/01-09/30	5	800	0
Horse Creek 0049	4,449	06/01-09/14	9	400	0
Totals				6,268	0
Fifteenmile Creek WSA					
Fifteenmile 1201	25,118	04/01-10/15	11	4,892	400
McCormick 1202	8,694	03/16-10/15	3	334	0
Totals				5,226	400[1]
Oregon Canyon WSA					
Fifteenmile 1201	25,118	04/01-10/15	7	1,389	0
McCormick 1202	8,694	03/16-10/15	26	1,212	215
Totals				2,601	215
Twelvemile Creek WSA					
Fifteenmile 1201	25,118	04/01-10/15	7	2,082	575
Totals				2,082	575[1]
Total all WSAs				20,073	1,095[1]

[1] A proposed fence in the Fifteenmile Allotment is common to the Fifteenmile and Twelvemile WSAs; it will allow an additional 120 AUMs of forage. Because it must be built in its entirety or not at all, the AUMs cannot be proportioned to either WSA. Therefore, both WSA totals include 120 AUMs, but the grand total has been adjusted to avoid double counting.

During the grazing season, infrequent use occurs in the northern part of the WSA along the way that parallels Willow Creek. A short way to the cow camp on private property in the headwater of Little Whitehorse Creek receives some use, but less than the boundary road. Other portions of the WSA are managed on horseback.

Disaster Peak WSA - The only route along this WSA that receives some use is the northern boundary road. This road is important for hauling salt and horses, supervising cattle, and for access west of the WSA. Most of the livestock in the WSA is managed on horseback. Helicopters are sometimes used to help gather cattle in the fall in the Zimmerman allotment. This use is limited to a few days a year.

Fifteenmile Creek WSA - Motor vehicle use is extensive in this WSA during the grazing period. Several interior ways as well as the boundary roads are used to check cattle and to haul salt and horses.

Oregon Canyon - Livestock operators make some use of motor vehicles along the ridges to manage the cattle. Elsewhere in the WSA, livestock are managed mostly by horseback.

Twelvemile Creek - Some use occurs on a few interior ways as well as the southern boundary road. These are used to check cattle and haul salt and horses.

Cultural Resources

Little is known about the area's cultural resources. Cultural surveys have been conducted in portions of

Table 9. Proposed Livestock Projects and Benefit/Cost (B/C) Ratios for Trout Creek Mountains Group (OR-3-152, 153, 156, 157, 162)

WSA	Proposed Projects	AUMs From Proposed Projects	Allotment No.	B/C Ratio
Willow Creek 3-152	1 spring	25	6015	Less than 1:1
Diaster Peak (3-153)	none	0		
Fifteenmile Creek (3-153)	1 reservoir	50	1201	More than 1:1
	2 springs	40	1201	
	6 miles fence [1]	195	1201	
	1300-ac brush control	115	1201	More than 1:1
Oregon Canyon (3-157)	1 reservoir	50	1202	Less than 1:1
	2 miles fence	165	1202	
Twelvemile Creek 3-162	1 spring	20	1202	More than 1:1
	1.5-mi fence [1]	240	1201	
	500-ac burn-and-seed	110	1201	Less than 1:1
	2250-ac brush control	205	1201	
Totals by type of development	Springs (4)	85		
	Fences [1] (4 totaling 9 miles)	480		
	Reservoirs (2)	100		
	Burn-and-seed (1 totaling 500 acres)	110		
	Brush Controls (2 totaling 3,550 acres)	320		
Grand Total		1,095		

[1] Includes a proposed fence in the Fifteenmile Allotment (No. 1201) that is common to the Fifteenmile and Twelvemile WSAs. The fence will allow an additional 120 AUMs of forage. Because it must be built in its entirety or not at all it cannot be proportioned to either WSA.

three of the WSAs (Willow Creek, Disaster Peak, and Fifteenmile) and all indicate that there is a high potential for the occurrence of significant cultural resources in the WSAs. The number of known sites are: Willow Creek WSA, 19 prehistoric and historic sites; Disaster Peak WSA, 19 prehistoric and historic sites; Fifteenmile Creek WSA, 2 prehistoric sites; and Oregon Canyon WSA, 9 prehistoric and historic sites.

Recreation Use

Primitive recreation opportunities are described in detail in the Wilderness section. Visitors pursue these activities in all the WSAs. Current recreational use levels in the Trout Creeks are unknown; however, use is increasing.

Excellent food and cover produce a healthy population of mule deer. Although the drainages throughout the WSAs make portions of the area somewhat difficult to hunt, hunting has been excellent and the area is very popular. Chukar are plentiful in portions of the WSA during years with good reproduction, and hunting is considered fair to good. Antelope, sage grouse, quail and small game populations also are present but many other areas offer equal success with easier access.

Fishing in the area is light due to the remoteness of the area, difficult access and a limited fishery.

Recreational horseback riding is somewhat limited by steep, rough terrain and livestock fences. Some use occurs in conjunction with other recreational pursuits, such as hunting.

The area has an excellent variety of subjects for bird and wildlife observers and photographers. The casual visitor may see mule deer, coyotes, rabbits, chipmunks, ground squirrels, sage grouse, doves, chukar, and a variety of snakes, lizards, raptors and songbirds, or, more uncommonly, beaver, owls and bobcats. Wildflowers are abundant during the spring and early summer, and fall colors are quite striking.

Much of the vehicle use and recreational activities now occurring in the WSAs are associated with hunting. Hunting access is dispersed along the boundary roads and ways of the WSAs. Hunters, hikers, and other recreationists enter the WSAs from the Trout Creek Mountain Road to the west, the county road that parallels McDermitt Creek to the south, and the roads from the northwest along Antelope and Willow Creeks. Some access occurs from the Kings River road in the southwest.

Once inside the group of WSAs, recreationists travel along the road on the divide across the top of the mountain range leading to ridges, headwater ravines, attractive campsites, and other travel corridors. From the ridge road, recreationists either drive down a secondary route or leave the vehicle. All major canyon bottoms are blocked by natural barriers and travel is limited to hiking or horseback riding.

Several roads to the lower end of some canyons are currently blocked for public access by private lands. Thus some visitors hike into the lower canyons around private land. This occurs at Whitehorse Canyon, Oregon Canyon, and Twelvemile Creek Canyon. It also occurs at Sherman Field on the top of the mountain range in the south-central portion of the group.

Approved ORV designations currently restrict off-road vehicle travel to existing roads and ways in the WSAs, except in the portion of the Disaster Peak WSA in Nevada, which is open to ORVs.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in the WSAs. As of January 1, 1984, there were no oil and gas or geothermal leases on the WSAs.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 10. The terms economic value and local personal income are discussed in the Statewide EIS volume. No economically significant changes in outputs are expected in the Disaster Peak WSA.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Table 10. Economic Value and Local Personal Income Generated Annually, Existing Program, Trout Creek Mountains Group (OR-3-152, 153, 156, 157, 162) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
COMBINED AREA				
Grazing	AUM	20,073	$151,350	$322,774
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Geothermal leases	Acres	1,862	1,862	561
Total existing			$153,212	$322,896
Willow Creek (OR-3-152)				
Grazing	AUM	3,896	$29,376	$62,648
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Disaster Peak WSA (OR-3-153)				
Grazing	AUM	6,268	$47,260	$100,789
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Fifteenmile Creek WSA (OR-3-156)				
Grazing	AUM	5,226	$39,404	$84,034
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oregon Canyon WSA (OR-3-157)				
Grazing	AUM	2,601	$19,612	$41,824
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Geothermal leases	Acres	1,862	1,862	561
Total existing			$21,474	$42,385
Twelvemile Creek WSA (OR-3-162)				
Grazing	AUM	2,082	$15,698	$33,479
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown

Effects on Wilderness Values

The **all wilderness alternative** would add the entire area of each WSA (28,810 acres in Willow Creek WSA; 30,490 acres in Disaster Peak WSA; 48,460 acres in Fifteenmile Creek WSA; 40,400 acres in Oregon Canyon WSA; and 26,960 acres in Twelvemile Creek WSA) totaling 175,120 acres to the National Wilderness Preservation System. It would preserve the hig desert terrain, ecosystems, and special features of the WSAs. Some of the impacts of wilderness designation would be the same in all of the areas.

Naturalness would be enhanced by closing the many ways, which would no longer receive vehicular use and would revegetate. A total of 115 miles of ways would be closed: 25 miles in the Willow Creek WSA, 18 miles in the Disaster Peak

WSA, 40 miles in the Fifteenmile Creek WSA, 12 miles in the Oregon Canyon WSA, and 20 miles in the Twelvemile Creek WSA. Complete revegetation might not occur because certain authorized vehicular use might continue, and some ways would be used as trails by recreationists and livestock.

Minerals could be explored for and developed on split-estate and private inholdings and on any claims which might be determined to be valid should mineral deposits be discovered before the areas were designated wilderness. The construction of roads or the establishment of ways to the sites and disruption of the surface at the site would increase the area influenced by the works of man. The amount of each WSA that would be subject to these impacts would depend upon the size and number of valid claims established in the WSA before wilderness designation, the amount of split-estate and private inholdings, and the mineral potential in each WSA.

Closure of ways would enhance opportunities for solitude. If mineral development occurred in the WSAs, increased traffic along the access routes and the sights and sounds of such development would reduce opportunities for solitude. The net effect would depend upon the extent of mineral development that took place and the proximity of developed sites.

The opportunities for primitive recreation that exist now would continue unless mineral development occurred on any valid existing claims, split-estate, or private inholdings. Such developments could reduce opportunities for primitive recreation by degrading scenery, eliminating a potential recreation site, reducing wildlife numbers and habitat, and disrupting recreation travel corridors and destinations.

Elimination of vehicle use on ways would improve opportunities for primitive recreation activities.

Special wilderness features could be adversely affected under the all wilderness alternative. Uncommon species such as cougar and bobcat might leave the areas if mineral development became extensive. If mineral development degraded water quality, populations of fish and other riparian related wildlife, such as beaver, could decline. Site-specific features, such as known cultural resources and sensitive plant species, probably would not be affected because the sites could be avoided.

The **preferred alternative** would add 136,160 acres to the NWPS assuming 8,200 acres of private and split-estate land could be acquired, and 980 acres of public land outside the WSA are added. This would include portions of Willow Creek WSA (12,810 acres), Disaster Peak WSA (28,890 acres), Oregon Canyon WSA (12,660 acres), and Twelvemile Creek (24,160), and all of Fifteenmile Creek WSA (48,460 acres). The combined area would be managed as a single wilderness area. Most of the wilderness features in the WSAs would be preserved. The area's naturalness would improve due to the closure to motor vehicle use of approximately 87 miles of ways, 14 miles of dead-end roads, and 43 miles of roads between the WSAs. Acquisition of the split-estate and private inholdings in the portion recommended suitable would substantially reduce the chances that mineral development would adversely affect wilderness values.

In the portion recommended suitable for wilderness, the elimination of motor vehicles on roads and ways within and between WSAs would improve opportunities for solitude by allowing users to disperse in a substantially larger area, by providing users with more potential travel corridors, and by increasing the number of secluded spots. Acquisition of inholdings would increase these opportunities even more. Because motor vehicle access to the area would be reduced, hikes to recreation destination points would be longer than is now the case. Special wilderness features would be protected from the adverse effects of mineral development on split-estate and private inholdings.

In the 48,140 acres recommended as nonsuitable for wilderness in the preferred alternative, mineral development could adversely affect wilderness values Development on the steep south and east slopes of the Oregon Canyon and Twelvemile Creek WSAs could be particularly disruptive because significant cuts and switchbacks would be required to build roads to the mines. Mineral development in the nonsuitable portion of the Willow Creek WSA could adversely affect the special wilderness features along Willow Creek, because the nonsuitable portion would extend down to the creek along much of the western boundary of the wilderness.

Five hundred acres in the Twelvemile Creek WSA would be seeded to crested wheatgrass, reducing the naturalness of that area. Proposed structural range developments, including a spring in the Willow Creek WSA, a fence and reservoir in the Oregon Canyon WSA, and a fence in the Twelvemile Creek WSA, would be developed. Vehicles would continue to be used in the nonsuitable portion, preventing routes from revegetating and continuing to adversely affect opportunities for solitude and primitive recreation.

Known cultural resource sites, known locations of plant species of special interest, and the Whitehorse cuthroat trout habitat would remain protected, to some degree.

In the **no wilderness/no action alternative**, wilderness values could be adversely affected by mineral developments anywhere in the five WSAs. The proposed structural range and wildlife projects would be constructed without regard to their effect on wilderness values. Reservoirs and spring developments, for example, could be built in a manner which left them more noticeable than if they were constructed in a wilderness area. The 3,550 acres of brush control and 500 acres of grass seeding projects would adversely affect naturalness in the immediate vicinity of projects. Vehicles used on ways and roads would continue to influence opportunities for solitude and primitive recreation.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Acreages that would be withdrawn under each alternative, including acres rated moderate for occurrence of certain minerals, are shown in table 11.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

The **preferred alternative and no wilderness/no action alternative** would allow the proposed 500-acre seeding in the Twelvemile Creek WSA since this project would be in the portion recommended nonsuitable. The seeding would temporarily eliminate cover of shrubs and forbs and would convert vegetation to crested wheatgrass, an introduced species. Introduction of crested wheatgrass would reduce vegetation diversity.

Under the **no wilderness/no action alternative**, an additional 2,250-acre brush control in the Twelvemile Creek WSA and a 1,300-acre brush control in the Fifteenmile Creek WSA would temporarily reduce vegetative diversity by reducing brush and forbs and increasing grasses.

In areas recommended nonsuitable, the federal candidate species would receive the same protection as federally listed threatened or endangered species. The ONHP species of special interest would not be formally protected and would thus be subject to disturbance; however, some of the ONHP species could be designated as BLM sensitive species and as such would receive the same protection as the federal candidate species.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under the **all wilderness alternative**, proposed riparian fencing and stream pool projects might be appropriate because they would correct the adverse effects of man's influence. A site-specific assessment would be prepared to determine if the projects conformed with Wilderness Management Policy. Should the projects be built, habitat would

Table 11. Effects of Alternatives on Mineral Development in the Trout Creek Mountains Group (OR-3-152, 153, 156, 157,162)

	Acres Withdrawn						
	All Wilderness					Preferred	No Wilderness/No Action
	Willow Creek (3-152)	Disaster Peak (3-153)	Fifteenmile (3-156)	Oregon Canyon (3-157)	Twelvemile Cr. (3-162)	(Portions of 4 WSAs, All of 1 WSA Combined)	(all 5 WSAs)
Total acres	28,810	30,490	48,460	40,400	26,960	126,980[1]	0
Geothermal rated moderate	28,810	30,490	48,460	40,400	26,960	126,980	0
Silver rated moderate	9,312	0	3,600	0	26,960	34,040	0
Gold rated moderate	0	15,010	0	713	26,960	39,170	0
Mercury rated moderate	28,810	0	48,460	11,020	0	62,928	0
Lithium rated moderate	28,810	30,490	48,460	40,400	26,960	126,980	0
Zeolites rated moderate	28,810	30,490	48,460	40,400	26,960	126,980	0
Beryllium rated moderate	0	15,010	0	0	0	15,010	0
Uranium rated moderate	0	0	9,100	7,847	5,755	14,855	0
Thorium rated moderate	0	0	9,100	0	0	9,100	0

[1] Development precluded on an additional 8,200 acres of private and split-estate land, if acquired, and 980 acres of public land, if added.

improve and fish populations would increase.

Impacts to wildlife under the **preferred alternative** would be the same as under the all wilderness alternative, except that acquiring non-WSA lands on Upper Willow, Little Whitehorse, and Fifteenmile Creeks might permit trout habitat improvements on those additional stream segments. Lack of vehicular access for hunters may also complicate harvest opportunities in the event of extensive mule deer population increases. Such events are not anticipated. Harvest of big game would be dependent upon pack-in (horseback) hunting and hunting around the edge of the wilderness area. Overall, big game populations would probably remain at present levels.

Under the **no wilderness/no action alternative**, trout habitat improvement projects would be allowed, thereby enhancing trout habitat. The brush control projects in Fifteenmile Creek WSA and Twelvemile Creek WSA would be allowed, resulting in increased habitat diversity by creating a niche that does not presently exist. The seeding would enhance habitat diversity and slightly increase forage for deer and antelope, but populations are not expected to increase. The vegetative treatment would not benefit most other wildlife species.

Effects on Livestock Grazing

The **all wilderness and preferred alternatives** may adversely affect livestock management because of the closure of ways or roads (discussed in more detail below). Motor vehicle uses for grazing management could be prohibited in wilderness; however, if there were no practical alternatives to vehicle use for livestock management, grazing operators may be allowed the minimum necessary use of vehicles.

Effects of the all wilderness alternative on livestock grazing in each WSA are discussed below. Any proposed structural projects might or might not be allowed depending on a site-specific assessment of whether it would conform with Wilderness Management Policy. Any vegetative manipulation projects (brush control, seeding) would not be allowed. The benefit/cost ratios for these projects are listed in table 9.

Willow Creek WSA - If the proposed spring development is not allowed, an additional 25 AUMs of livestock forage would be foregone, precluding a change in cattle distribution and utilization in the pasture. Restrictions on vehicle use of the way along Willow Creek could impede adequate distribution of salt, livestock inspection, and hauling of horses in this area. Access to the cow camp near the southern end of this way is important for livestock management.

Disaster Peak WSA - There would be no significant impacts to livestock management under the all wilderness alternative.

Fifteenmile Creek WSA - If the proposed two springs, one reservoir and two fences are not allowed, an additional 285 AUMs of livestock forage would be foregone, precluding a change in cattle distribution and utilization. The proposed 1,300-acre brush control in Doolittle Creek Canyon would not be allowed, foregoing an estimated 115 AUMs. Restrictions on vehicles would cause additional adverse impacts by making it more difficult to distribute salt, haul in horses or check cattle.

Oregon Canyon WSA - If the proposed fence and the proposed reservoir are not allowed, an additional 215 AUMs of livestock forage would be foregone preventing a change in utilization of forage in the pastures. Restrictions on vehicles in the WSA would inconvenience livestock operators by requiring horses and cattle to be trailed more to reach the canyons, and requiring salt to be hauled mostly by horseback.

Twelvemile Creek WSA - If the proposed two fences and a spring development are not allowed, an additional 260 AUMs for forage would be foregone, a change in cattle distribution and utilization of livestock forage could not occur. The proposed 2,250-acre brush control and a 500-acre seeding in the Twelvemile Creek Canyon would not be allowed, foregoing an estimated 315 AUMs. Restrictions on vehicles by livestock operators within this WSA would cause additional adverse impacts by making it more difficult to distribute salt, haul in horses or check cattle.

Impacts under the **preferred alternative** would be the same as the all wilderness alternative except that projects in the nonsuitable portions would be allowed without wilderness constraints. The proposed spring development would be allowed in the Willow Creek WSA. In the Oregon Canyon WSA, the proposed fence and reservoir would be allowed. In the Twelvemile Creek WSA, the proposed seeding and one of the fences would be allowed. Impacts due to vehicle restrictions would be increased because dead-end boundary roads and common road boundaries generally would not be open for vehicle use. As explained above, these impacts may be insignificant because vehicle use for grazing management may be permitted if there are no practical alternatives.

Under the **no wilderness/no action alternative**, all the proposed projects would be allowed resulting in an increase of 1,095 AUMs and better distribution of livestock. There would be no restrictions on motor vehicle use and thus no impacts on livestock management in any of the WSAs.

Effects on Recreation Use

Under the **all wilderness alternative**, closing ways would only slightly inconvenience visitors to the WSAs. Recreationists could continue to hike to most points in the study areas from the boundary roads. If the stream projects are allowed, a slight increase in fishing would occur. No change in overall recreation use is expected under this alternative.

Under the **preferred alternative**, vehicles would be stopped some distance from the more popular locations within the area. The added inconvenience might discourage some visitors, but the area's special features and primitive recreation opportunities would continue to attract recreationists. Many would horsepack into their favorite camps or camp in less desirable, more easily accessible locations. Easements across private land would enhance recreation by making the area more accessible.

In portions not recommended as suitable for wilderness the current recreational use patterns would not change unless resource development, such as vegetative manipulation projects, adversely affect natural features which make the recreation activity possible or enhance its quality. If stream projects are allowed, a slight increase in fishing would occur. A shift from vehicle-oriented to primitive recreation with little change in overall recreation use is expected under this alternative.

Under the **no wilderness/no action alternative**, recreational use in the WSAs would not change unless, as described above, developments altered the recreational environment. The stream projects would increase fishing use slightly. Little change in overall recreation use is expected.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 12a-e and 13a-e. Tables 12a-e show the effects on economic value and tables 13a-e, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as fences, reservoirs and springs proposed for these WSAs, would be constructed if the areas were designated wilderness; nor is it known if the grazing increases would be allowed. It is known that vegetative manipulation projects, such as the proposed burns to control sagebrush and seedings, would not be allowed.

The columns for the **all wilderness and preferred alternatives** show the effects as a range of values dependent upon whether structural improvements and/or grazing operator access were allowed.

Currently, vehicles are used for livestock management in the combined areas. The all wilderness and preferred alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operators in the WSAs would be an increase in cost of about $897 per year.

Table 12a. Effects of Alternatives on Annual Economic Value, Combined Area, Trout Creek Mountains Group (OR-3-152, 153, 156, 157, 162) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ Preferred	No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +665	+470 to +775	+1,095
Fishing [2]	RVD	0 to +21	+14 to +21	+21
Geothermal leases	Acres	-1,862	-1,862	0
VALUE OF PLANNED INVESTMENTS [3]				
Grazing	$	0 to +5,014	+3,544 to +5,844	+8,256
Fishing	$	0 to +417	+278 to +417	+417
Total [4]	$	0 to +5,431	+3,822 to +6,261	+8,673
Investments [5]	$	0 to -3,630	-2,530 to -4,476	-6,900
Net Economic Value	$	0 to +1,801	+1,292 to +1,785	+1,773
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Geothermal leases	$	-1,862	-1,862	0
Reduced access [6]	$	-634	-897	0
Total	$	-2,496	-2,759	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-2,496 to -695	-1,467 to -974	+1,773

[1] Expected future increases due to range improvement investments.

[2] Expected future increases from proposed projects.

[3] Vegetative manipulation projects involving $40,585 total expenditures, and structural projects involving up to $45,050. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Detail may not sum to "Total" due to rounding.

[5] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[6] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 12b. Effects of Alternatives on Annual Economic Value, Willow Creek WSA (OR-3-152) (1981 price levels)

Item	Unit of Measure	All Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +25	+25	+25
VALUE OF PLANNED INVESTMENTS [2]				
Grazing	$	0 to +189	+189	+189
Total [3]	$	0 to +189	+189	+189
Investments [4]	$	0 to -282	-282	-282
Net Economic Value	$	0 to -93	-93	-93
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access [5]	$	0	-263	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	0 to -93	-356	-93

[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $3,500 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Detail may not sum to "Total" due to rounding.

[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 12c. Effects of Alternatives on Annual Economic Value, Fifteenmile Creek WSA (OR-3-156) (1981 price levels)

Item	Unit of Measure	All Wilderness, Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +285	+400
Fishing [2]	RVD	0 to +7	+7
VALUE OF PLANNED INVESTMENTS [3]			
Grazing	$	0 to +2,149	+3,016
Fishing	$	0 to +139	+139
Total [4]	$	0 to +2,288	+3,155
Investments [5]	$	0 to -1,793	-2,675
Net Economic Value	$	0 to +495	+480
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Reduced Access [6]	$	-315	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-315 to +180	+480

[1] Expected future increases due to range improvement investments.
[2] Expected future increases from proposed projects.
[3] Vegetative manipulation projects involving $10,931 total expenditures, and structural projects involving up to $22,250. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Detail may not sum to "Total" due to rounding.
[5] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[6] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 12d. Effects of Alternatives on Annual Economic Value, Oregon Canyon WSA (OR-3-157) (1981 price levels)

Item	Unit of Measure	All Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +215	+215	+215
Fishing [2]	RVD	0 to +14	+14	+14
Geothermal leases	Acres	-1,862	-1,862	0
VALUE OF PLANNED INVESTMENTS [3]				
Grazing	$	0 to +1,621	+1,621	+1,621
Fishing	$	0 to +278	+278	+278
Total [4]	$	0 to +1,899	+1,899	+1,899
Investments [5]	$	0 to -725	-725	-725
Net Economic Value	$	0 to +1,174	+1,174	+1,174
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access [6]	$	-177	-177	0
Geothermal leases	$	-1,862	-1,862	0
Total	$	-2,039	-2,039	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-2,039 to -865	-865	+1,174

[1] Expected future increases due to range improvement investments.
[2] Expected future increases from proposed projects.
[3] Structural projects involving up to $9,000. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Detail may not sum to "Total" due to rounding.
[5] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[6] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 12e. Effects of Alternatives on Annual Economic Value, Twelvemile Creek WSA (OR-3-162) (1981 price levels)

Item	Unit of Measure	All Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +260	+230 to +370	+575
VALUE OF PLANNED INVESTMENTS [2]				
Grazing	$	0 to +1,960	+1,734 to +2,790	+4,336
Investments [3]	$	0 to -1,507	-1,523 to -2,353	-3,896
Net Economic Value	$	0 to +453	+211 to +437	+440
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access [4]	$	-142	-142	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-142 to +311	+69 to +295	+440

[1] Expected future increases due to range improvement investments.

[2] A vegetative manipulation project involving $29,654 total expenditures, and structural projects involving up to $18,700. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[4] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 13a. Effects of Alternatives on Local Personal Income, Combined Area, Trout Creek Mountains Group (OR-3-152,153,156,157,162) (1981 price levels)

Item	Unit of Measure	All Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +665	+470 to +775	+1,095
Fishing [2]	RVD	0 to +21	+14 to +21	+21
Geothermal leases	Acres	-1,862	-1,862	0
INCOME FROM PROPOSED INVESTMENTS [3]				
Grazing	$	0 to +10,693	+7,557 to +12,462	+17,608
Fishing	$	0 to +248	+165 to +248	+248
Construction activity [4]	$	0 to +6,187	+4,312 to +7,628	+11,760
Total [5]	$	0 to +10,941	+7,722 to +12,710	+17,856
INCOME FROM OTHER EXPECTED CHANGES IN OUTPUTS				
Geothermal leases	$	-561	-561	0
INCOME FROM ALL OUTPUT CHANGES				
All categories	$	-561 to +10,380	+7,161 to +12,149	+17,856

[1] Expected future increases due to range improvement investments.

[2] Expected future increases from proposed projects.

[3] Vegetative manipulation projects involving $40,585 total expenditures, and structural projects involving up to $45,050. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and fishing activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

Table 13b. Effects of Alternatives on Local Personal Income, Willow Creek WSA (OR-3-152) (1981 price levels)

Item	Unit of Measure	All Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +25	+25	+25
INCOME FROM PROPOSED INVESTMENTS [2]				
Grazing	$	0 to +402	+402	+402
Construction activity [3]	$	0 to +481	+481	+481
Total [4]	$	0 to +402	+402	+402

[1] Expected future increases due to range improvement investments.

[2] Structural projects involving up to $3,500 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.

Table 13c. Effects of Alternatives on Local Personal Income, Fifteenmile Creek WSA (OR-3-156) (1981 price levels)

Item	Unit of Measure	All Wilderness, Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +285	+400
Fishing [2]	RVD	0 to +7	+7
INCOME FROM PROPOSED INVESTMENTS [3]			
Grazing	$	0 to +4,583	+6,432
Fishing	$	0 to +83	+83
Construction activity [4]	$	0 to +3,056	+4,557
Total [5]	$	0 to +4,666	+6,515

[1] Expected future increases due to range improvement investments.

[2] Expected future increases from proposed projects.

[3] A vegetative manipulation project involving $10,931 total expenditures, and structural projects involving up to $22,250. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and fishing activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

Table 13d. Effects of Alternatives on Local Personal Income, Oregon Canyon WSA (OR-3-157) (1981 price levels)

Item	Unit of Measure	All Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +215	+215	+215
Fishing [2]	RVD	0 to +14	+14	+14
Geothermal leases	Acres	-1,862	-1,862	0
INCOME FROM PROPOSED INVESTMENTS [3]				
Grazing	$	0 to +3,457	+3,457	+3,457
Fishing	$	0 to +165	+165	+165
Construction activity [4]	$	0 to +1,236	+1,236	+1,236
Total [5]	$	0 to +3,622	+3,622	+3,622
INCOME FROM OTHER EXPECTED CHANGES IN OUTPUTS				
Geothermal leases	$	-561	-561	0
INCOME FROM ALL OUTPUT CHANGES				
All categories	$	-561 to +3,061	+3,061	+3,622

[1] Expected future increases due to range improvement investments.

[2] Expected future increases from proposed projects.

[3] Structural projects involving up to $9,000. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and fishing activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

Table 13e. Effects of Alternatives on Local Personal Income, Twelvemile Creek WSA (OR-3-162) (1981 price levels)

Item	Unit of Measure	All Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +260	+230 to +370	+575
INCOME FROM PROPOSED INVESTMENTS [2]				
Grazing	$	0 to +4,181	+3,698 to +5,950	+9,246
Construction activity [3]	$	0 to +2,568	+2,595 to +4,010	+6,640
Total [4]	$	0 to +4,181	+3,698 to +5,950	+9,246

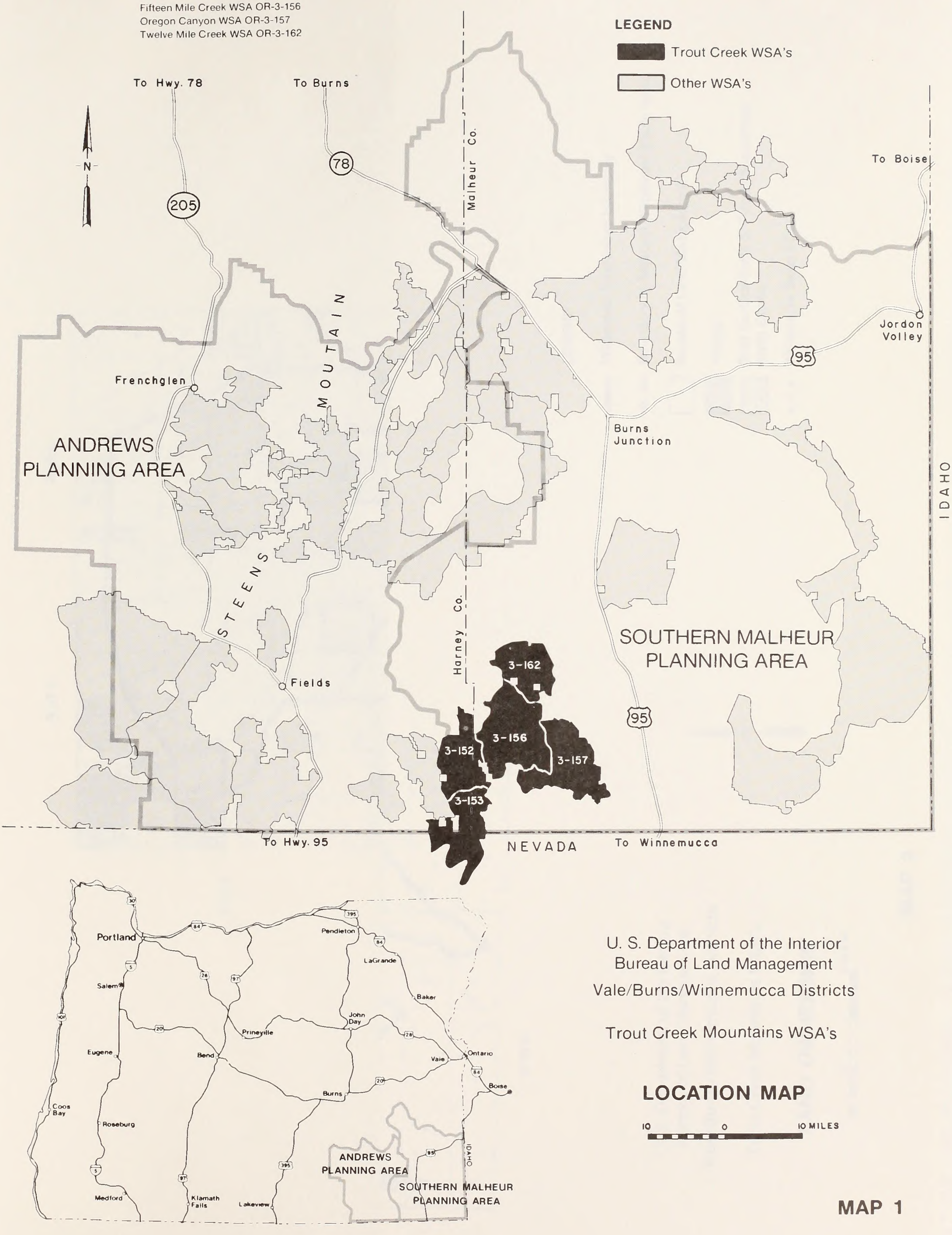
[1] Expected future increases due to range improvement investments.

[2] A vegetative manipulation project involving $29,654 total expenditures, and structural projects involving up to $18,700. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.

Willow Creek WSA OR-3-152
Disaster Peak WSA OR-3-153
Fifteen Mile Creek WSA OR-3-156
Oregon Canyon WSA OR-3-157
Twelve Mile Creek WSA OR-3-162

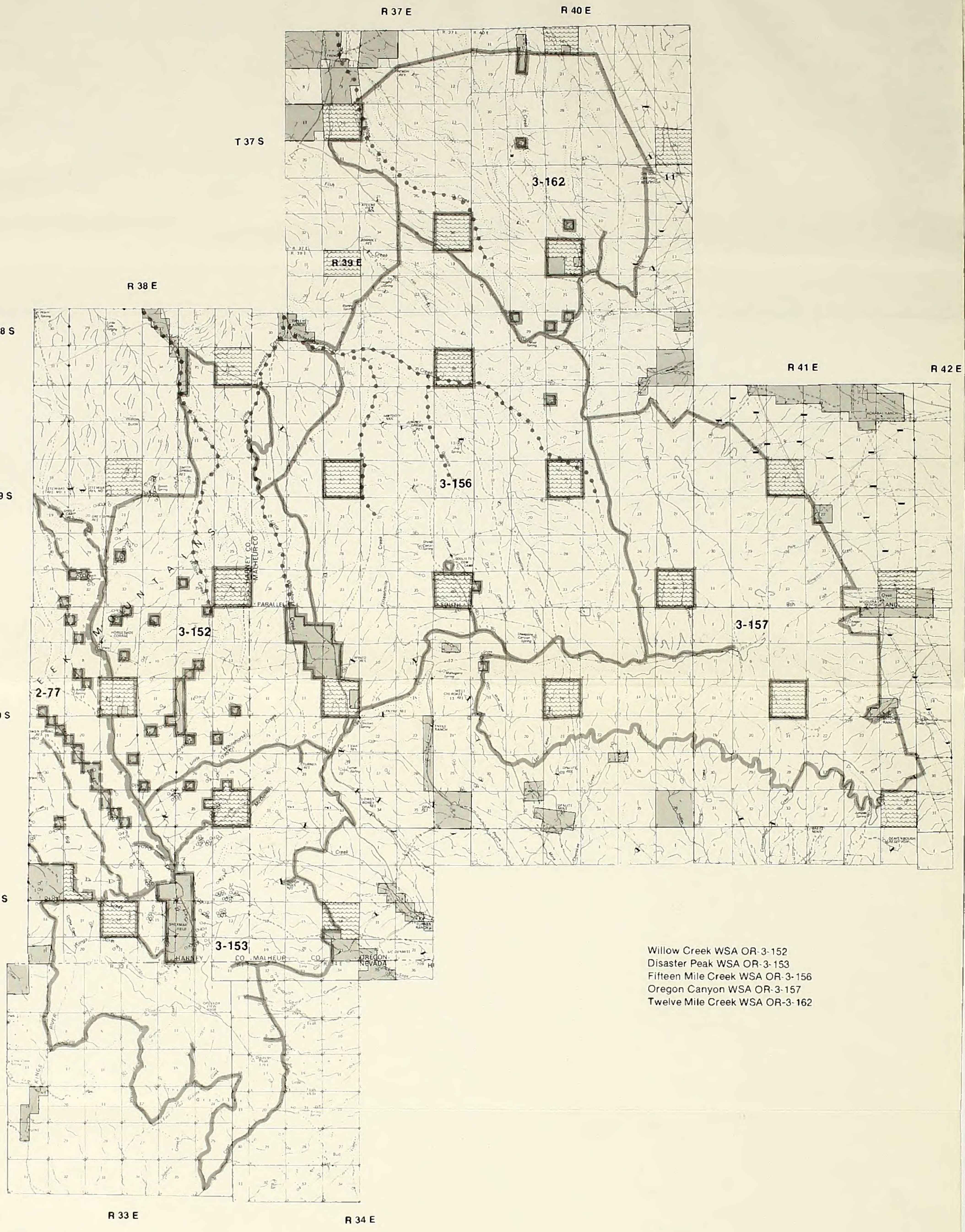


U. S. Department of the Interior
Bureau of Land Management
Vale/Burns/Winnemucca Districts

Trout Creek Mountains WSA's

LOCATION MAP

MAP 1



Willow Creek WSA OR-3-152
Disaster Peak WSA OR-3-153
Fifteen Mile Creek WSA OR-3-156
Oregon Canyon WSA OR-3-157
Twelve Mile Creek WSA OR-3-162

LEGEND

▬	Wilderness Study Area Boundary
‒ ‒	Boundary of Adjacent Wilderness Study Areas
☐	Bureau of Land Management
■	Private
▤	BLM Surface-State or Private Subsurface (Split Estate)
• • •	Whitehorse Basin ACEC

U. S. Department of the Interior
Bureau of Land Management
Vale/Burns/Winnemucca Districts

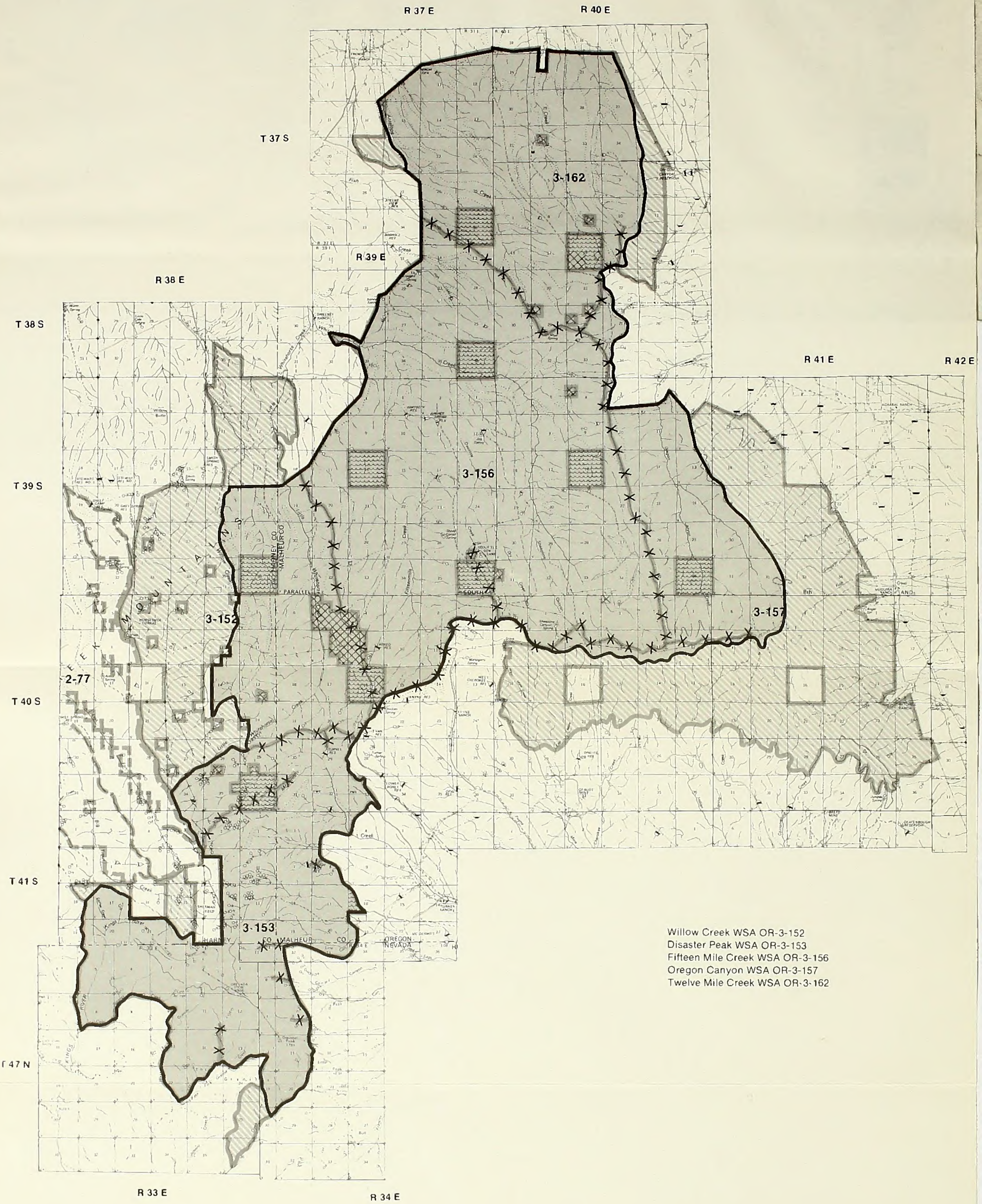
Trout Creek Mountains WSA's

LAND OWNERSHIP

1 0 1 2 MILES

N

MAP 2



Willow Creek WSA OR-3-152
Disaster Peak WSA OR-3-153
Fifteen Mile Creek WSA OR-3-156
Oregon Canyon WSA OR-3-157
Twelve Mile Creek WSA OR-3-162

LEGEND

Wilderness Study Area Boundary

Boundary of Adjacent Wilderness Study Areas

Recommended Suitable for Wilderness

Recommended Non-suitable for Wilderness

Non-Federal Land within Recommended Wilderness

Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

Recommended Road Closure

U. S. Department of the Interior
Bureau of Land Management
Vale/Burns/Winnemucca Districts

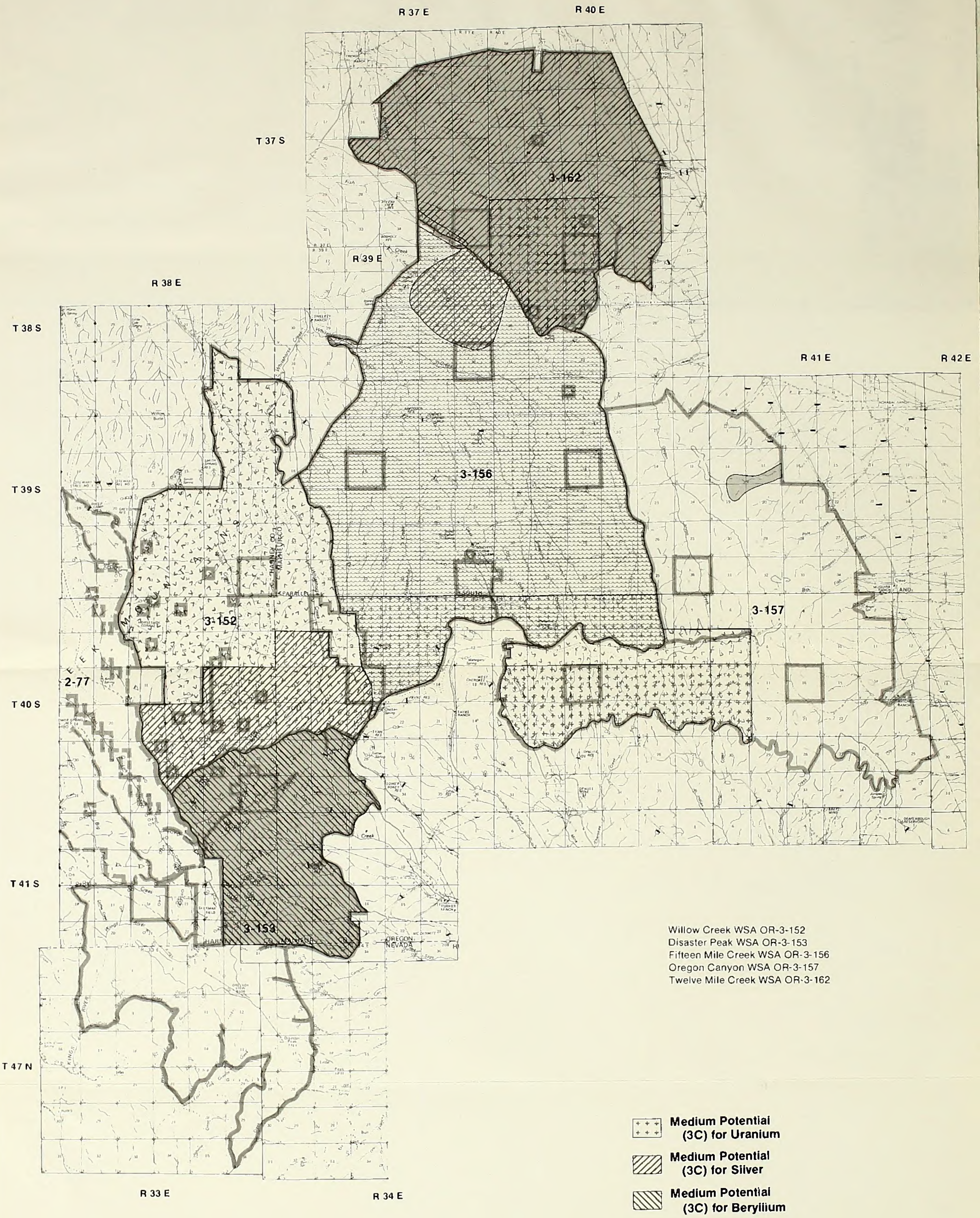
Trout Creek Mountains WSA's

PREFERRED ALTERNATIVE

1 0 1 2 MILES

N

MAP 3



Willow Creek WSA OR-3-152
Disaster Peak WSA OR-3-153
Fifteen Mile Creek WSA OR-3-156
Oregon Canyon WSA OR-3-157
Twelve Mile Creek WSA OR-3-162

⁜	**Medium Potential (3C) for Uranium**
▨	**Medium Potential (3C) for Silver**
▧	**Medium Potential (3C) for Beryllium**
≋	**Medium Potential (3A) for Mercury**
⌐	**Medium Potential (3C) for Mercury**
▩	**Medium Potential (3C) for Gold**

Entire WSA:
Medium Potential
(3B) for Geothermal Resources
(3A) for Lithium and Zeolites

U. S. Department of the Interior
Bureau of Land Management
Vale/Burns/Winnemucca Districts

Trout Creek Mountains WSA's

MEDIUM OR HIGH POTENTIAL
MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Willow Creek WSA, OR-3-152. South-central portion of the WSA looking north down Little Whitehorse Creek toward Whitehorse Butte. Within area recommended suitable under the preferred alternative. September 1983.

Willow Creek WSA, OR-3-152. South-central portion of the WSA looking west toward the headwaters of Little Whitehorse Creek. Within area recommended suitable under the preferred alternative. September 1983.

Disaster Peak WSA, OR-3-153. Northeastern portion of the WSA looking southwest. Within area recommended suitable under the preferred alternative. Disaster Peak is on the horizon center, the South Fork of McDermitt Creek is on the far right and the North Fork of McDermitt Creek cuts across the mid-ground of the photo. September 1983.

Disaster Peak WSA, OR-3-153. South-central portion of the WSA on the Nevada side looking west across "The Granites". Within area recommended suitable under the preferred alternative. Note the dead-end road at the foot of the ridge at left center. September 1983.

Disaster Peak WSA, OR-3-153. North-central portion of the WSA looking west at the headwaters of North Fork of McDermitt Creek. Within area recommended suitable under the preferred alternative. September 1983.

Fifteenmile Creek WSA, OR-3-156. South-central portion of WSA looking south up Fifteenmile Creek. Within area recommended suitable under the preferred alternative. Way barely visible at bottom of drainage. September 1983.

Fifteenmile Creek WSA, OR-3-156. South-central portion of WSA looking south. Within area recommended suitable under the preferred alternative. Shows beaver bonds along creek. September 1983.

Fifteenmile Creek WSA, OR-3-156. North-central portion of WSA looking west down Little Whitehorse Creek Canyon. Within area recommended suitable under the preferred alternative. September 1983.

Oregon Canyon WSA, OR-3-157. Northwest portion of WSA looking south. Within area recommended suitable under the preferred alternative. The East fork of Oregon Canyon is on the left and the West Fork is on the right. September 1983.

Oregon Canyon WSA, OR-3-157. Southeastern boundary looking west up Angel Canyon. Within area recommended nonsuitable under the preferred alternative. September 1983.

Twelvemile Creek WSA, OR-3-162. Central portion of the WSA looking north up Dry Creek Canyon. Within area recommended suitable under the preferred alternative. September 1983.

Twelvemile Creek WSA, OR-3-162. Southwestern portion of the WSA looking north toward the central portion of the WSA. Within area recommended suitable under the preferred alternative. Dry Creek is on the right and Twelve Mile Creek is on the left. Coyote Lake outside the WSA, a playa near the Alvord Desert, is visible at the upper left. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Upper West Little Owyhee Wilderness Study Area (OR-3-173)

General Description of Study Area

The Upper West Little Owyhee wilderness study area (WSA) is in Malheur County, approximately 80 miles south of Jordan Valley and 10 miles northeast of McDermitt, Nevada. U.S. Highway 95 lies 10 miles west of the WSA (see map 1).

The WSA contains 58,660 acres of public land (see map 2). Six parcels totaling 3,840 acres of split-estate (federally managed surface, state or privately owned subsurface mineral rights) are scattered throughout the WSA.

In addition, 160 acres of private land are located at the end of a dead-end road in the southwest corner of the WSA. The private land is not inside the WSA because the WSA boundary extends along the dead-end road, but the private parcel is surrounded by BLM land.

The study area is approximately 10 miles long and 3 miles wide in the northwestern portion, while the southern portion is approximately 12 miles long and 6 miles wide. The boundary of the WSA consists of roads, two adjacent parcels of split-estate and one parcel of private land, a fence and the boundary of the McDermitt Indian Reservation. Two dead-end roads, a mile each, enter the WSA forming part of the boundary, one to Bell Springs along the northeastern boundary and the other to the private inholding.

The WSA contains level to rolling sagelands deeply cut by three major canyons. Antelope Creek flows northerly about 13 miles through the northwest part of the WSA. Much of the canyon is lined by 50- to 100-foot-high rimrock of a reddish-gray color. West Little Owyhee Canyon flows northeasterly about 18 miles through the southern portion. The lower nine miles are dominated by vertical cliffs and outcroppings that rise several hundred feet above the river bed and channel the stream in places through gaps five to eight feet wide. During the dry summer season, the water in the canyon recedes and is generally concentrated in deep, clear, cool pools in the narrow canyon segments.

Massie Canyon, a tributary to the West Little Owyhee, flows easterly for seven miles and joins the main canyon 1.5 miles upstream from Anderson Crossing, the point at which the Westt Little Owyhee River leaves the WSA. It is similar to the lower portion of West Little Owyhee Canyon, containing short stretches of narrow vertical canyon walls. Jeff's Reservoir, located within Massie Canyon, is stocked annually with trout and can be reached by a way (a vehicle route established and maintained solely by the passage of vehicles).

Sagebrush and grasses are the dominant plants in the WSA. Sedges, rushes, and a few aspen grow in riparian zones and mountain mahogany grows on the canyon rims.

Interrelationships

The WSA is an appendage to a chain of eight other WSAs that extend nearly 180 miles along the Owyhee River drainage, from the Nevada/Idaho border to Rome, Oregon. Descriptions and analyses of alternatives for these WSAs are included in the Draft Owyhee Canyonlands Wilderness Environmental Impact Statement which was issued by BLM's Boise District Office in March 1984.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- the presence of a 160-acre private inholding (the effects of wilderness designation on private lands are addressed in the Statewide EIS volume),

- potential mineral development,

- presence of two interior dead-end roads and the problems that could result if these roads were closed, and

- the area's wilderness values, including outstanding opportunities for solitude and primitive recreation and special features including scenery, sage grouse, crucial antelope range, unique ecological interrelationships and cultural resources.

Description of the Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness (preferred alternative)
- no wilderness/no action

A partial alternative is not analyzed because there are no major resource conflicts that would warrant recommending only a part of the WSA as suitable for wilderness.

All Wilderness

Under the all wilderness alternative, all 58,660 acres of public land in the WSA would be recommended suitable as wilderness (see map 2). For purposes of analysis, this alternative assumes the split-estate and private inholdings would not be acquired and the dead-end roads would remain open.

Enhanced Wilderness (Preferred Alternative)

Under the enhanced wilderness alternative, 58,660 acres of public land would be recommended suitable as wilderness and the two dead-end roads totaling two miles in length would be closed (see map 3). An attempt would be made to acquire the 160-acre private inholding and the 3,840 acres of split-estate in the WSA. These parcels could be acquired through purchase or exchange with willing owners.

Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 62,660 acres.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development,

- continued restriction of ORV use to existing roads and trails, and

- development of a recreation site at Jeff's Reservoir.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 1. Summary of Proposed Management Under Each Alternative, Upper West Little Owyhee WSA (OR-3-173)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	58,660	58,660	0
Acres Closed to ORVs by Wilderness Designation	58,660	58,660	0
Miles of Roads Closed	0	2	0
Miles of Ways Closed	16	16	0
Acres of Full Fee Estate Acquired[1]	0	160	0
Acres of Split Estate Acquired [1]	0	3,840	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	58,660	58,660	0
Unallocated Existing Forage Allocated (AUMs)	0-5,770	0-5,770	5,770
Recreation Projects Developed (number)	0	0	1

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area is capable of being managed to preserve its wilderness characteristics. Manageability would be enhanced if the private and split-estate inholdings were acquired and the two dead-end roads were closed. The acquisitions would prevent potential adverse effects from access to and development of these parcels.

Rationale for the Selection of the Preferred Alternative

The enhanced wilderness alternative is preferred because the benefits of preserving the area's wilderness values -- including the undeveloped plateaus and canyons, the undisturbed riparian lands, large sage grouse and antelope populations, and outstanding opportunities for solitude and primitive recreation -- would outweigh the benefits of maintaining options for development.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA appears to be generally natural. Thirty-six interior man-made features influence approximately 6 percent of the WSA. (The area of influence is an estimate of the acreage from which these features can be seen.) These man-made features consist of 5 fences (10 miles), 3 reservoirs, 7 springs, 2 pipelines (totaling 1 mile), a hunter's outhouse, a corral, some survey poles, and 16 ways (totaling 16 miles). With the exception of one fence crossing the WSA, Jeff's Reservoir and the way just west of Horse Hill, these features are within two miles of the WSA boundary.

Outside man-made features that affect the naturalness of the area consist of boundary roads, fences, springs and several cow camps. They do not substantially affect the area's wilderness qualities.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The uniform shape and large size of the study area substantially enhances a visitor's ability to experience solitude.

While recreation use would be concentrated in the three main canyons, there is sufficient room and variety to effectively screen visitors from one another. The winding canyon and riparian vegetation screen the view within the canyon rims. Much of the topography surrounding the canyon is undulating plateau with shallow draws, low rolling hills, and scattered rims that provide a considerable amount of screening. Areas with very little topographic screening include a small plateau north of Deer Flat, a small plateau south of Horse Hill, and a narrow strip paralleling the Anderson Crossing road.

Outside sights and sounds are minor and are associated with ranching activities, traffic on

Table 2. Summary of Environmental Consequences of Alternatives, Upper West Little Owyhee WSA (OR-3-173)

Resource or Activity	All Wilderness	Enhanced Wilderness (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 58,660 acres to NWPS and preserve area's undeveloped plateaus and canyons, undisturbed riparian lands, large sage grouse and antelope populations, and outstanding opportunities for solitude and primitive recreation. Adverse effects could occur due to mining activity on private and split-estate inholdings. Closure of 16 miles of ways would enhance wilderness values. Area would be manageable as wilderness.	Similar to all wilderness, except acquisition of private and split-estate land would prevent adverse impacts from possible mining activity. Area would be manageableas wilderness.	Possible adverse effects if increased mining activity or ORV use occurs.
Energy and Mineral Development	Development precluded on 58,660 acres, including 58,660 acres with moderate potential for geothermal resources, oil and gas, mercury, bentonite, and zeolites, and 1,662 acres with moderate potential for manganese.	Same as all wilderness except development precluded on an additional 4,000 acres if private and split-estate land is acquired.	No impact.
Wildlife	Wildlife habitat preserved. If riparian protection fence is allowed, fish and wildlife habitats associated with riparian zone would be enhanced.	Same as all wilderness.	Riparian protection fence would be built, resulting in improved fish and wildlife habitat.
Livestock Grazing	No significant impact. Access road to Jeff's Reservoir would be closed, increasing livestock operator costs. Proposed allocation of 5,770 AUMs of available forage in pastures might be foregone.	Same as all wilderness, except road to Bell Springs cow camp might be closed, complicating livestock management.	No impact. 5,770 AUM increase in pastures through allocation of existing forage.
Recreation Use	Closure of vehicle access to Jeff's Reservoir would substantially reduce fishing there. Closure of ways would reduce hunter use. Visitation increases elsewhere would offset declines in fishing and hunting.	Same as all wilderness.	No change.
Economic Value and Local Income	Increase in economic value and local personal income by $43,425 and $92,782, respectively, if the full adjustment to use available but unallocated forage were allowed. Decrease of $81 in economic value and no change in local personal income if adjustment were not allowed. The maximum increase in transportation costs to livestock operators would be $81.	Same as all wilderness.	Increase in economic value and local personal income by $43,506 and $92,782, respectively, from adjustments to use currently available but unallocated livestock forage.

boundary roads and low-level aircraft flights.

Due to the presence of water, shade, scenery, and wildlife in the three canyons, recreation opportunities are outstanding for backpacking, day hiking, photography, camping, sightseeing, bird watching and horseback riding.

Special Features

The Upper West Little Owyhee River canyon is unique in that it is deeply incised with interesting erosional patterns and varied rock formations.

The area supports the largest summer concentration of antelope in Malheur County. The area also contains the largest year-round concentration of sage grouse and whitetail jackrabbits in the county, according to the Oregon Department of Fish and Wildlife (ODFW).

The vegetation in portions of West Little Owyhee Canyon is virutally pristine because the rugged canyon walls prevent livestock grazing. The ungrazed riparian zones exemplify the natural tall lush growth of grass, reeds and sedges.

The quality of scenery is outstanding in this WSA because of the deep, winding and narrow canyons variety of colors (reds, browns, tans and greens), rugged rock outcroppings, and clear, cool, deep pools of water in the canyon bottoms.

The WSA offers special opportunities for cultural studies. (The Cultural Resources section further discusses cultural sites in the WSA.)

Special opportunities also exist for scientific and educational study of the plants and animals of the WSA, especially in Massie and Upper West Little Owyhee Canyon and the sagebrush ecosystems above the canyon rims. The whitetail and blacktail jackrabbits, sage grouse and antelope ranges are of particular interest.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler method of classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and the potential natural vegetation is sagebrush-steppe. Of the plant communities listed in the Owyhee Uplands section of the Oregon Natural Heritage Plan, the WSA contains the low sagebrush/bluebunch wheatgrass, low sagebrush/Sandberg's bluegrass and low sagebrush/Idaho fescue communities.

Boise, Idaho, is the only standard metropolitan statistical area with population over 100,000 within 5 hours' driving time of the WSA.

Energy and Mineral Development

The energy and mineral resources of the WSA were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment and rock chip sampling by Oregon Department of Geology and Mineral Industries (DOGAMI) under BLM contract. This geochemical survey is the primary basis for the metallic minerals classification in the WSA (see below). The DOGAMI report is entitled "Geology and Mineral Resources of 18 BLM Wilderness Study Areas, Harney and Malheur Counties, Oregon". Using the DOGAMI report and a heavy mineral analysis conducted by Barringer Resources, Inc., the study area was reevaluated by BLM personnel.

The WSA has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is considered to be moderately favorable for the occurrence of geothermal resources, oil and gas, bentonite, zeolites, and mercury, and parts of the WSA are moderately favorable for manganese. Mercury and manganese are strategic and critical minerals that have moderate favorability in the WSA; however, there there are no known deposits of such minerals in the WSA. As of January 1, 1984, there were no oil and gas or geothermal leases and no mining claims in the study area.

The mineral potential classifications for the WSA are shown in table 3. Map 4 shows the area rated moderate (medium) for manganese.

Oil and gas and geothermal are the two main potential energy resources in the area. Because of youthful volcanism and above-normal heat flow, most of southeastern Oregon is generally considered favorable for thermal waters for direct heat use. Smaller areas within this area are favorable for high temperature geothermal resources. None has been identified within the

Table 3. Classification of Energy and Mineral Potential, Upper West Little Owyhee WSA (OR-3-173)

Commodity	Area	Classification Level	Confidence Level
Metals			
Lead, beryllium	Entire WSA	2	C
Mercury	Entire WSA	3	A
Manganese	See map 4	3	A
Gold and silver	Part of WSA (not shown on map)	2	B
	Rest of WSA	1	A
Geothermal	Entire WSA	3	A
Uranium/Thorium	Entire WSA	1	B
Coal	Entire WSA	2	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	2	B
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	3	B
Zeolites	Entire WSA	3	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

WSA. Oil and gas potential will largely depend on the presence or absence of suitable marine rock at depth. There has been no deep drilling in the vicinity that has penetrated the Tertiary volcanic cover.

The Owyhee Upland is an area of broad uplift with no major structural features apparent in the WSA. The rocks of this area are typical of those generated in a tensional tectonic regime. However, the youthful pattern of linear fault-bound ranges separated by elongated alluvial valleys are conspicuously absent in this transitional area.

The oldest and most widespread rocks in the area are upper Miocene siliceous volcanic rocks (partly to densely welded tuffs and rhyolite or dacite flows). Some glass partly or completely converted to alkali feldspar and cristobalite either from glass phase alteration or devitrification. Locally, rocks contain layers of fresh vitrophyre and vitrophyre breccia. It is not known what underlies these rocks at depth. No metallic mineralization is known in the WSA.

Vegetation

Although the predominant vegetation in the WSA is low sagebrush with an understory of grasses, a variety of plant species may be found here. The plateaus support dryland plants that include juniper trees (in the Horse Hill area), shrubs such as bitterbrush, snowberry and squaw currant, grasses such as giant wildrye and Thurber's needlegrass, and forbs such as phlox, wooden balsamroot and evening primrose. Antelope Creek and West Little Owyhee River canyons provide habitat for a variety of riparian species that include rushes, sedges, rose, gooseberry and shrubby willows. Mountain mahogany and some aspen groves grow between the creeks and rims. Much of this vegetation is pristine because the cliffs have effectively prevented livestock grazing.

More than half of the WSA is a low sagebrush/Sandberg's bluegrass vegetative community, and the rest is a low sagebrush/bluebunch wheatgrass community and low sagebrush/Idaho fescue community. The majority of the vegetation is in a late-seral stage with the remainder in a mid-seral stage. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.)

Wildlife

Most of the wildlife habitat in the WSA is in excellent condition. The high plateaus contain preferred summer habitat for sage grouse and antelope. While the rugged canyons of Antelope Creek and Upper West Little Owyhee River provide habitat for many wildlife species. The canyons are particularly important for nesting raptors such as golden eagle, prairie falcon, kestrels, red-tailed hawks and possibly merlin. Mule deer are common within the riparian communities.

From its confluence with Massie Canyon at the eastern boundary of the WSA to six miles upstream, the Little Owyhee River is confined by a deep, vertical-walled canyon. The canyon is severely scoured during spring runoff periods but the river becomes intermittent in the summer, leaving long, deep pools isolated by long stretches of dry riverbed. Dry season pools over ten feet deep provide excellent habitat for rainbow trout, redside shiners, bridgelip sucker and speckled dace.

Riparian vegetation, from heavy spring water flows in the lower six miles of the West Little Owyhee River in the WSA, is limited to grasses and forbs because severe scouring eliminates rigid woody species. Trout and riparian habitat improve dramatically for the next five miles upstream as the narrow canyon widens and streambanks are less subject to scouring. Boulders form deep pools and restrict livestock, except in the last few upstream miles within the WSA where the stream becomes a trickle with excellent fish and riparian habitat potential that is currently limited by grazing. The land use plan proposes protecting this portion of the river through livestock management or exclusion of livestock by fencing.

Bell Springs is a natural meadow which was enclosed by fence during the 1960s to exclude livestock grazing in order to enhance wildlife habitat and protect water quality for wildlife and livestock. The present wildlife habitat is excellent.

Fingerling trout are planted annually by ODFW in Jeff's Reservoir.

Livestock Grazing

Portions of 3 grazing allotments are within the WSA. Table 4 shows the existing and potential livestock use in AUMs (animal unit months, the amount of

Table 4. Existing and Potential Livestock Use, Upper West Little Owyhee WSA (OR-3-173)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Available but Unallocated Forage in Pastures (AUMs)
Campbell (No. 1306)	14,364	08/15-10/15	16	1,618	5,770
Louse Canyon Community (No. 1307)	11,135	06/01-09/30	26	1,560	0
Star Valley Community (No. 1402)	6,495	05/15-10/31	1	88	0
Totals	31,994			3,266	5,770

forage needed to sustain one cow and calf, or equivalent animals, for one month).

Existing livestock developments in the WSA (among the man-made features mentioned in the Naturalness section) include 10 miles of fence, 12 water developments, and a corral. Should the grazing system not improve riparian habitat, then a fence would be constructed to exclude livestock from riparian habitat on the upper part of the West Little Owyhee River in the WSA.

Livestock operators use motor vehicles primarily along the boundary roads, the road to Bell Spring, the way to Jeff's Reservoir, and the road to a private inholding on the southwest boundary. Livestock are managed in other parts of the WSA by horseback. Trailer facilities at Bell Spring serve as a cow camp for management of livestock by horseback in adjacent areas.

Licensed livestock grazing in pastures wholly or partially in the WSA is proposed to be increased by 5,770 AUMs by allocating available forage. Increases in the WSA would vary according to the amount of pasture in the WSA and other factors such as terrain and vegetation.

Cultural Resources

Seven cultural sites have been discovered in the WSA, including two undisturbed petroglyphs. One site is associated with hunting blinds constructed from rock and the other was an intensively used aboriginal campsite where a wide range of tools and materials were found. The remaining sites consist of four temporary prehistoric camp areas where stone tools appear to have been manufactured.

Recreation Use

Primitive recreation in the WSA includes backpacking, day hiking, fishing, hunting, bird watching, rock climbing, camping, horseback riding, sightseeing and photography. Motor vehicle access to Antelope Creek is limited to the Anderson Crossing Road in the northern part of the WSA. West Little Owyhee Canyon and Massie Canyon are accessible by five ways, all of which terminate at the West Little Owyhee Canyon rim. The only road access into this canyon occurs at Anderson Crossing at the eastern boundary. Use of off-road vehicles (ORV) in the WSA is limited to existing roads and ways. Use is minor and usually associated with hunting, day hiking, sightseeing, or backpacking.

Recreation use at Jeff's Reservoir includes fishing, hunting, and associated camping. Two self-contained restrooms are planned at the reservoir to alleviate a sanitation problem.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 3,266 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $24,626 annually, and local personal income generated by existing outputs amounts to $52,517 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 58,660 acres to the National Wilderness Preservation System (NWPS) and would preserve the area's undeveloped plateaus and canyons, undisturbed riparian lands, large sage grouse and antelope populations, and outstanding opportunities for solitude and primitive recreation.

The all wilderness alternative would preserve the existing natural character of the WSA and the outstanding opportunities for solitude and primitive recreation, unless mineral development occurred on the private land and split-estate inholdings. Two sections of split-estate land (640 acres each) are of particular concern because they are located in or adjacent to Little Owyhee River where most primitive recreation is likely to occur.

A proposed fence to exclude livestock from riparian areas might or might not be constructed depending on a site-specific assessment of whether it would conform with Wilderness Management Policy. If not allowed, an opportunity to enhance the natural character of the riparian zone would be foregone.

Closure of the 16 miles of ways would allow the ways to revegetate. The area's naturalness would be enhanced and opportunities for solitude and primitive recreation would be improved. The road into the private inholding would remain open, so its impact on the area's naturalness would not change.

The **enhanced wilderness alternative** would add 62,660 acres to the NWPS, assuming the 4,000 acres of private and split-estate land could be acquired as proposed under this alternative. It would also close the two miles of dead-end roads, as well as the 16 miles of ways. This would prevent potential impacts of mineral development and assure the preservation of naturalness and opportunities for solitude and primitive recreation.

Under the **no wilderness/no action alternative**, the proposed fence to protect riparian areas could be constructed. Mining and increased ORV use could cause localized adverse impacts to naturalness, opportunities for solitude and primitive recreation and special features.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 58,660 acres under the **all wilderness alternative**, and 58,660 acres, plus an additional 4,000 acres if the private and split-estate land is acquired, as proposed under the **enhanced wilderness alternative**.

These withdrawals would include the areas rated moderate for geothermal, oil and gas, mercury, bentonite, and zeolites, which encompass the entire WSA, and 1,662 acres rated moderate for manganese.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness. Under the **all and enhanced wilderness alternatives**, the proposed fence to exclude livestock from riparian areas along Little Owyhee River might be appropriate in wilderness because it would correct the adverse effects of man's influence. A site-specific assessment would be prepared to determine if it conformed with Wilderness Management Policy. If the fence were built, it would enhance the important fish and wildlife habitats associated with the riparian zone.

Under the all and enhanced wilderness alternatives, closure of the way into Jeff's Reservoir might limit access for fish stocking to aircraft. A limited amount of natural reproduction of trout occurs in the tributary stream feeding Jeff's Reservoir and reduced fishing (resulting from the way closure) may allow the fish population to maintain itself naturally.

The **no wilderness/no action alternative** would allow the proposed riparian fencing (should it be necessary), resulting in improved fish and wildlife habitat.

Effects on Livestock Grazing

Since increases in licensed use through allocation of available forage might not be allowed under Wilderness Management Policy, all increases in pastures partially in areas recommended suitable might be foregone. Thus, increases foregone within these pastures would range from 0 to 5,770 AUMs under the **all and enhanced wilderness alternatives**.

Closure of the way to Jeff's Reservoir would increase the time and cost for livestock operators to haul salt and riding stock and to supervise cattle. Livestock operators would be allowed to use vehicles on the route if it were determined that there were no practical alternatives.

Under the enhanced wilderness alternative impacts would be similar to the all wilderness alternative. In addition, the road to Bell Spring would also be closed, eliminating vehicle access to the trailer facilities at Bell Spring. These facilities might still be used with access by horseback.

There would be no significant impacts to livestock grazing under the **no wilderness/no action alternative**. Livestock operators would be allowed continued access to existing roads and ways.

Effects on Recreation Use

Under the **all wilderness alternative**, vehicular access to Jeff's Reservoir would be eliminated due to the closing of the way. This would eliminate the vehicle-oriented fishing use. Fishermen would be required to hike 3 1/2 miles. Construction of pit toilets at the reservoir would not be allowed (or be necessary because of the reduced use). Closing all the ways would also restrict vehicular access to the West Little Owyhee and Massie Canyon, thus reducing day hikes in the central portion of the West Little Owyhee Canyon.

Closure of the ways would also eliminate vehicle-oriented hunting. As the public becomes aware of the area's wilderness qualities, increased visitation from backpackers would probably offset the decrease in fishing use at Jeff's Reservoir, in day hikers in the West Little Owyhee Canyon, and in vehicle-oriented hunters in the WSA.

The impacts under the **enhanced wilderness alternative** would be the same as for the all wilderness alternative. Closing the two short spur roads into Bell Spring and the private inholding would not appreciably alter the visitation pattern from that expected under the all wilderness alternative.

Under the **no wilderness/no action alternative**, the current visitation pattern and recreation use would continue.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known if the grazing increases would be allowed under the enhanced wilderness or all wilderness alternatives.

The column for the wilderness alternatives shows the effects as a range of values dependent upon whether grazing operator access, and/or grazing adjustments were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness and enhanced wilderness alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $81 per year.

Table 5. Effects of Alternatives on Annual Economic Value, Upper West Little Owyhee WSA (OR-3-173) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +5,770	+5,770
VALUE OF EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustments	$	0 to +43,506	+43,506
Reduced access [2]	$	-81	0
Total	$	-81 to +43,425	+43,506

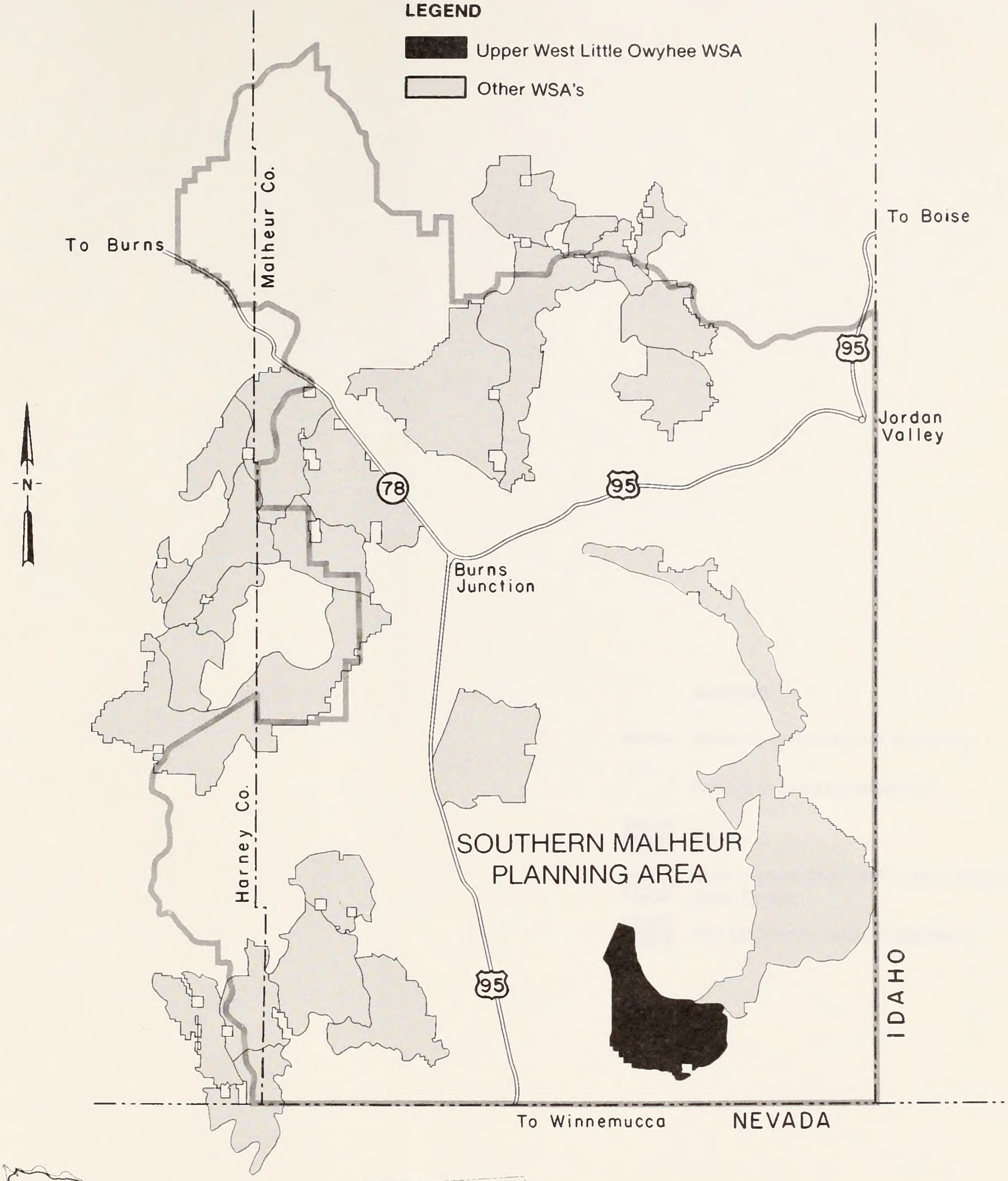
[1] Adjustments to use currently available but unallocated livestock forage.

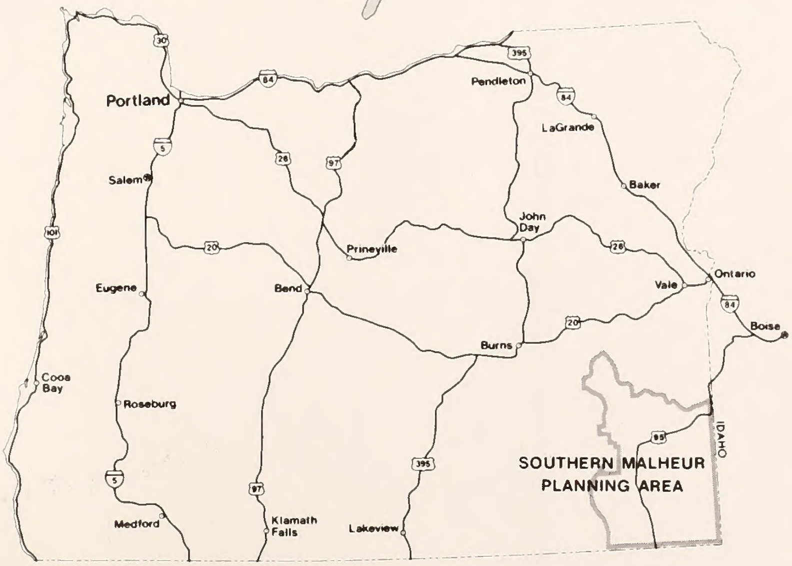
[2] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 6. Effects of Alternatives on Local Personal Income, Upper West Little Owyhee (OR-3-173) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +5,770	+5,770
INCOME FROM EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustments	$	0 to +92,782	+92,782

[1] Adjustments to utilize currently available but unallocated livestock forage.





U.S. Department of the Interior
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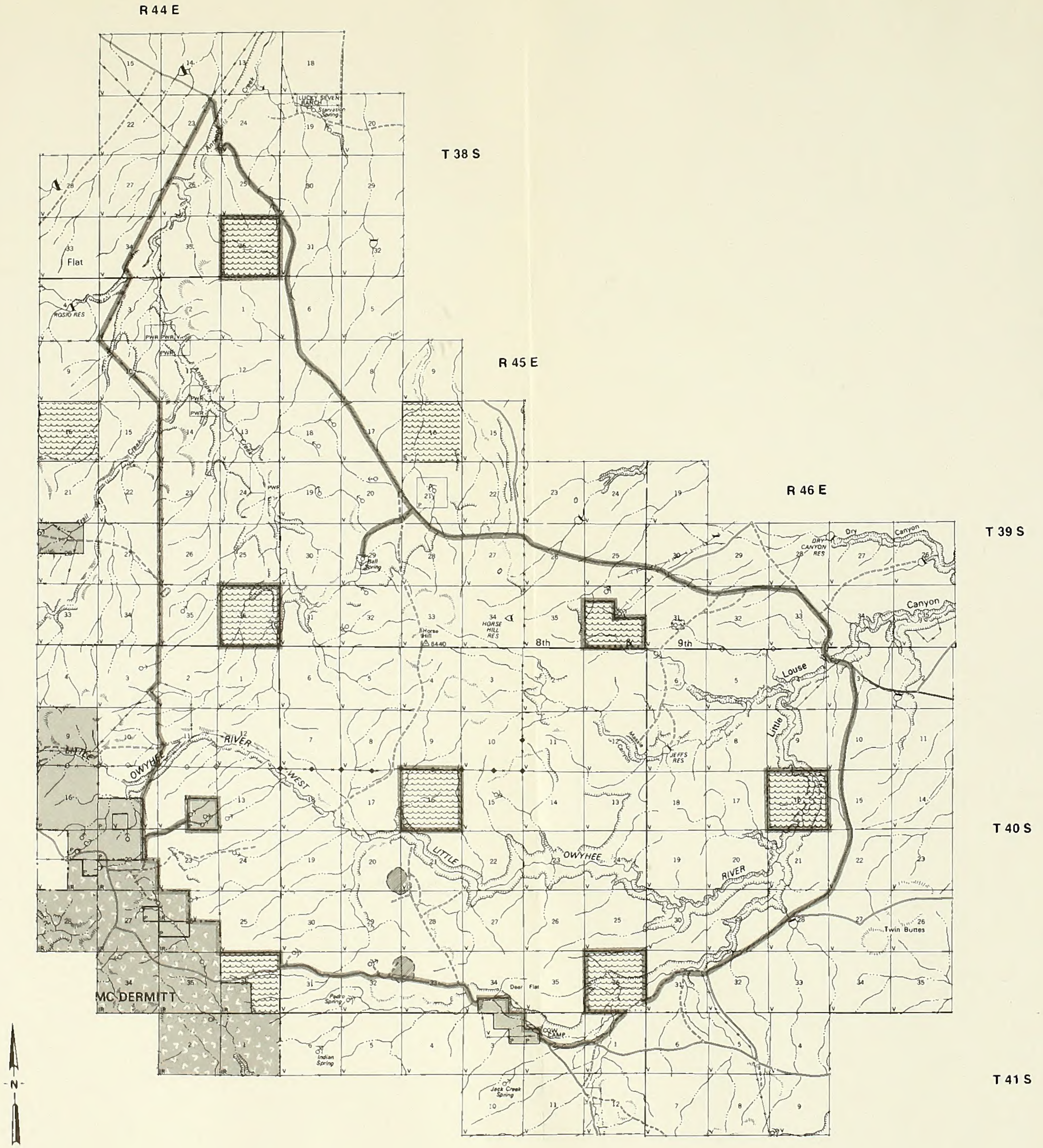
Vale District

Upper West Little Owyhee WSA
OR-3-173

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▬ Wilderness Study Area Boundary
- ☐ Bureau of Land Management
- ▩ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)
- ▨ Fort McDermitt Indian Reservation

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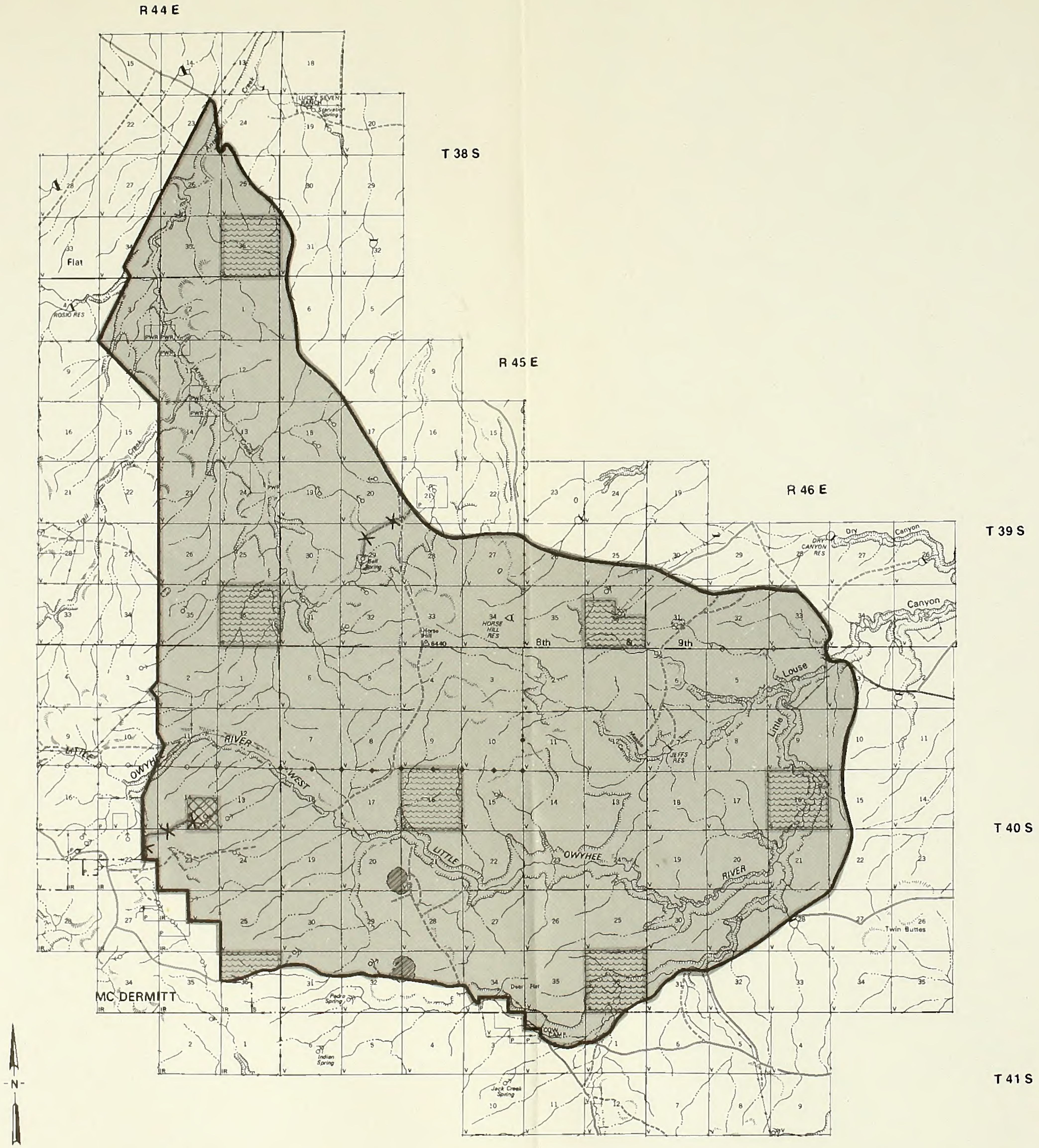
Upper West Little Owyhee WSA
OR-3-173

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

▢ Recommended Suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

✗ ✗ Recommended Road Closure

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Upper West Little Owyhee WSA
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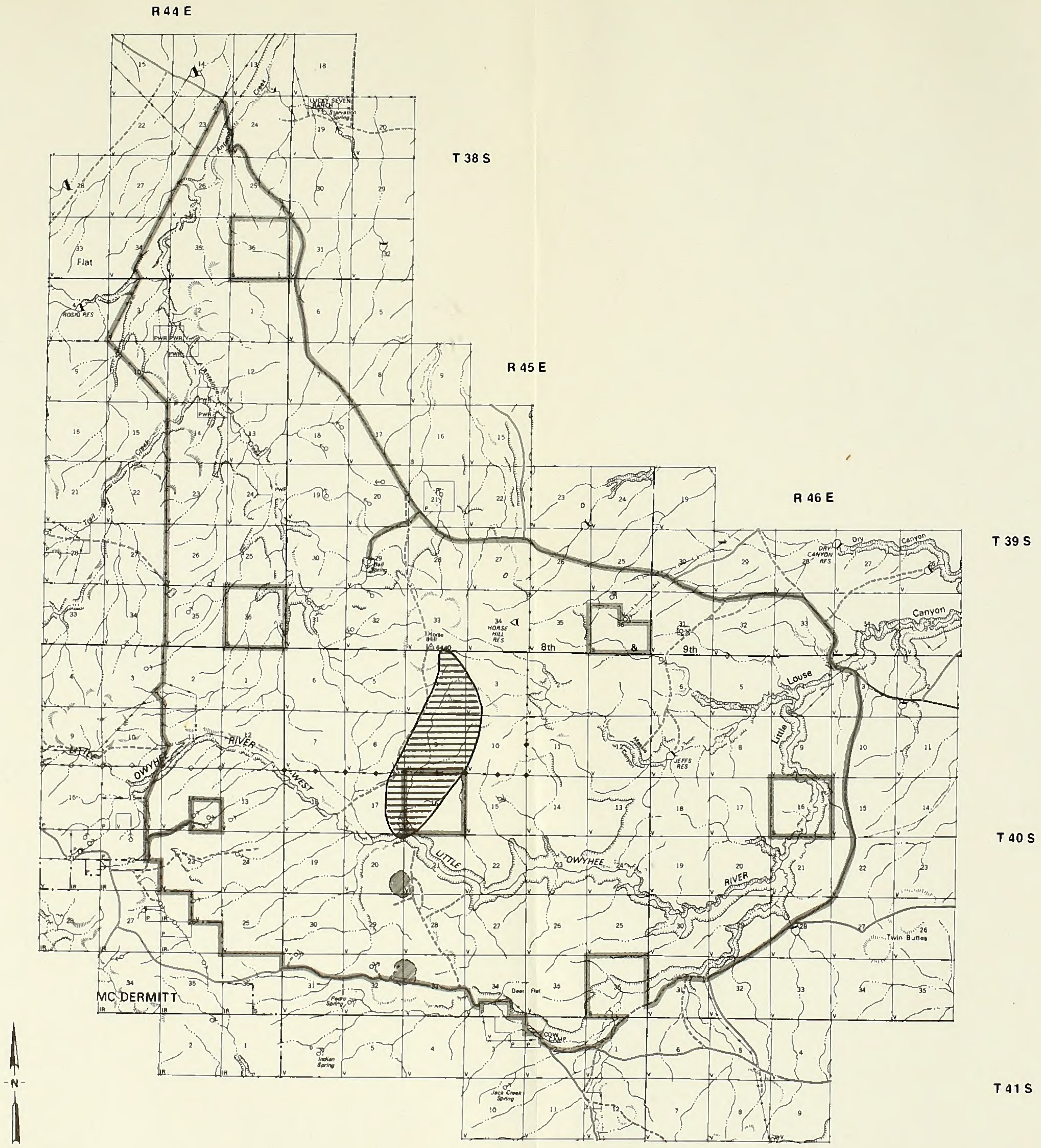
ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



Entire WSA:
Medium Potential
(3A) for Mercury and Geothermal Resources
(3B) for Oil and Gas, Bentonites and Zeolites

▤ **Medium Potential (3A) for Manganese**

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Upper West Little Owyhee WSA
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MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Upper West Little Owyhee WSA, OR-3-173. Southern portion of WSA looking east along the Upper West Little Owyhee drainage (Louse Canyon. Within area recommended suitable under the enhanced (preferred) alternative. September 1983.

Upper West Little Owyhee WSA, OR-3-173. Central portion of WSA looking north up Antelope Creek. Within area recommended suitable under the enhanced (preferred) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Homestead Wilderness Study Area (OR-6-2)

General Description of Study Area

The Homestead wilderness study area (WSA) is located on the west side of the Snake River adjacent to Oregon State Highway 86 in Baker County, Oregon, approximately 75 miles northeast of Baker, Oregon, and 20 miles northeast of Halfway, Oregon (see map 1). This WSA is being jointly studied by the BLM and the Forest Service.

The WSA contains 6,321 acres of BLM land and 7,654 acres of Forest Service land (see map 2). The BLM land includes 6,161 acres located east of the Wallowa-Whitman National Forest and 160 acres south of the national forest and separated from the other BLM land by Forest Service and private land. The Forest Service land includes 6,260 acres in the Homestead RARE II (the Forest Service's second roadless area review and evaluation) further planning unit, 200 acres of formerly private land (in three parcels) acquired by the Forest Service, and 1,194 acres in the northwest portion of the WSA which were transferred from BLM to the Forest Service in 1983 through provisions of the Hells Canyon National Recreation Area Act.

This 1,194-acre tract was transferred to the Forest Service with the provision that it remain subject to wilderness review until Congress determines whether the entire WSA will be designated wilderness.

There are 320 acres of private inholdings in the BLM portion of the WSA.

The WSA is almost 10 miles long, five miles wide at its widest point and 400 yards at its narrowest point. Its average width is two miles. The WSA is bordered by private land on the east and south, a parcel of split-estate land (federally managed surface, state or privately owned subsurface mineral rights) on the north and east, national forest land on the west and public land on the north. The boundary is irregular on the north, east and northwest sides.

The Homestead WSA is on a north-south running hogback ridge. Very short steep drainages (0.5 to 2.5 miles) run east to west through rugged canyons.

The majority of the area lies on the east-facing slope that fronts Hells Canyon Reservoir. McClain Gulch, the major drainage, occurs on the Forest Service portion of the WSA; it runs in a southern direction to the southern boundary, a distance of three miles.

Vegetation in the area is diverse and includes bunchgrass, cheatgrass and wheatgrass, big sagebrush, elderberry, hawthorne, poison ivy and snowberry, and Douglas-fir, white fir and ponderosa pine.

Interrelationships

The boundary of the Hells Canyon National Recreation Area (NRA) follows the crest of a north-south hogback ridge through most of the WSA. A total of 5,414 acres of Forest Service land in the study area is also located in the Hells Canyon NRA, including all of the 1,194 acres transferred from BLM to the Forest Service and 4,220 acres in Homestead RARE II area 6291. These lands are withdrawn from energy and mineral location and leasing under the NRA designation.

The Homestead WSA is across Pine Creek Canyon from the Sheep Mountain WSA. If these areas were designated wilderness, a relatively continuous line of National Forest-BLM wilderness would extend approximately 60 miles along the west side of the Snake River from the mouth of the Imnaha River to about two miles above Brownlee Dam.

A portion of the WSA near the Snake River is part of a power site reserve, a power site classification, and Federal Energy Regulatory Commission classifications which earmark the land for potential water power and water storage development. These "withdrawals" are scheduled for review in the next few years, which may lead to their revocation. Power site development has already placed Hells Canyon Reservoir on the river below the WSA, but does not include any of the WSA. Such development is therefore not discussed further.

The entire WSA falls within lands which were ceded to the U.S. Government by the Nez Perce Indian Tribe by ratified treaty. This treaty reserved rights for hunting, fishing, and gathering in usual and accustomed places and grazing livestock on unclaimed land.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- current and future exploration and development of minerals,
- access to private inholdings (see Statewide EIS volume),
- plant species of special interest and bald eagles,
- timber harvest in the WSA, and
- outside sights and sounds that influence the naturalness of the WSA.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- partial
- no wilderness/no action (preferred alternative)

All Wilderness

Under the all wilderness alternative, all 13,975 acres of federally managed land in the study area (6,321 acres BLM and 7,654 acres Forest Service) would be recommended suitable as wilderness (see map 2). For purposes of analysis, it is assumed the 320 acres of private inholdings would not be acquired.

Partial

The partial alternative would recommend 8,455 acres (2,255 acres BLM and 6,200 acres Forest Service) suitable as wilderness and 5,520 acres as nonsuitable (see map 3). In addition, an attempt would be made to acquire 320 acres of private inholdings. The private parcels could be acquired through purchase or exchange with willing owners.

Assuming acquisition of these parcels, the total area recommended suitable under this alternative would be 8,775 acres.

The area identified as nonsuitable consists of the northern third of the WSA and the two small, isolated pieces of Homestead RARE II area 6291. This portion would be recommended as nonsuitable because it would not be manageable as wilderness. The northern boundary of the suitable area would run east/west along the ridge immediately south of Bob Creek.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The BLM portion of the WSA area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- restriction of ORV use to existing roads and trails,
- continued availability for mineral exploration and development,
- granting of road access to private inholdings, and
- timber harvest on 330 acres of commercial forest land.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Management of the Forest Service portion of the WSA is guided by the Hells Canyon NRA Management Plan and the Burnt Powder Unit Plan.

Relevant features of these plans include the following:

Hells Canyon NRA Management Plan (covers west side of the ridge; 5,414 acres):

- maintenance of the visual character as primary goal for viewed areas,
- continued prohibition of mineral location and leasing under the current withdrawal, and
- continued management for dispersed recreation use (no intensive recreation development).

Burnt Powder Unit Plan (covers east side of the main ridge; 2,250 acres):

- continued wildlife management primarily for big game winter range,
- continued availability for mineral exploration and development, and
- continued management for dispersed recreation use.

Table 1. Summary of Proposed Management Under Each Alternative, Homestead WSA (OR-6-2)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness [1]	13,975	8,455	0
Acres Closed to ORVs by Wilderness Designation	13,975	8,455	0
Acres of Full Fee Estate Acquired[2]	0	320	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation [3]	8,561	4,235	0
Acres of Timber Available for Harvest	0	330	330
Average Annual Volume of Timber Sold (Mbf-Thousand Board Feet)	0	33	33

[1] Acreage includes adjacent, jointly studied national forest lands (Homestead Further Planning Area) totaling 7,654 acres under all wilderness and 6,200 acres under the partial alternative.

[2] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[3] The portions of the study area in the Hells Canyon National Recreation Area (5,414 acres under all wilderness and 4,220 acres under the partial alternative) are already withdrawn from mineral location and leasing.

Manageability of the Area as Wilderness

The northern part of the WSA would not be manageable as wilderness under the all wilderness alternative. Two small pieces of the Homestead RARE II area, comprising 86 acres, do not adjoin this or any other WSA. They lie next to sections of BLM-administered lands outside the WSA which do not have wilderness characteristics.

The entire WSA has a high potential for the occurrence of gold and copper but mining activity has been concentrated in the northern part of the WSA, and all of the mining claims in the WSA are located in that part of the study area. If claimants discovered valuable mineral deposits before the area was designated wilderness, they could develop

Table 2. Summary of Environmental Consequences of Alternatives, Homestead WSA (OR-6-2)

Resource or Activity	All Wilderness	Partial	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 13,975 acres (6,321 BLM; 7,654 USFS) to NWPS. Preserve outstanding opportunities for primitive recreation, scenery, and special wilderness features, e.g., plants of special interest and bald eagles, unless mining claims were determined to be valid and claims were developed. Access to and development of private inholdings could adversely affect naturalness, recreation and special features. Northern one-third not manageable as wilderness; rest of area manageable.	Would add 8,775 acres (2,255 BLM; 6,200 USFS) to the NWPS, assuming acquisition of 320 acres private land. Preserves all major wilderness characteristics as in all wilderness alternative, except mineral development could adversely affect wilderness characteristics in the non-suitable northern area. The suitable area would be manageable as wilderness if private inholdings were acquired and mineral development on valid claims did not occur. Timber harvest in nonsuitable area would adversely affect naturalness.	ORV use (limited to existing roads and trails) would reduce quality of primitive recreation activity. Development of minerals would adversely affect scenery, primitive recreation, bald eagles, and the area's naturalness. Timber harvest would adversely affect naturalness.
Energy and Mineral Developent	Development precluded on 8,561 acres, including 8,561 acres with high potential for metals. Lands within the Hells Canyon NRA (5,414 acres) are already withdrawn from mineral development	Development precluded on 4,235 acres, plus an additional 320 acres if private land is acquired; includes 4,555 acres with high potential for metals. NRA lands are already withdrawn from mineral development.	No impact.
Soils	Protection from erosion by man-caused activities, except for valid mining claims.	In suitable area, same as all wilderness. High potential for mineral development in nonsuitable area, which could cause soil loss and erosion. Timber harvest could cause soil erosion and compaction in nonsuitable area.	Same as nonsuitable portion of partial alternative.
Wildlife	Wildlife habitat preserved.	In nonsuitable area, mining would displace wildlife and destroy habitat. Timber harvest would alter condition and distribution of forage and cover, diminishing hiding and thermal cover for deer and elk over short term. Timber harvest would remove critical wintering habitat for ecotone-dependent species. Removal of old-growth timber would displace species dependent upon it, e.g., pileated woodpeckers. Populations of cavity nesters would decline.	Same as in nonsutitable area of partial alternative.
Wood Products Harvest	Precludes timber harvest on 330 acres foregoing 33Mbf of annual production.	Permits timber harvest on 330 acres of commercial timber land.	Same as partial.
Recreation Use	Eliminates conflict between ORVs and other recreationists. Little change in overall recreation use.	Same as all wilderness in suitable area. Additional access in nonsuitable portion from timber harvest and mining. Some decline in hunting in short term due to loss of game from developments. No significant impact on overall recreation use.	Same as in nonsuitable portion of partial alternative, except that development would reduce hunting opportunities. Slight net reduction in overall recreation use.
Economic Value and Local Income	Decrease in economic value and local personal income by $1,815 and $6,630, respectively, from loss of timber harvest.	No impact.	No impact.

their claims regardless of whether wilderness values would be impaired. In view of the high mineral potential, past and current mining activity in the vicinity, and the large number of claims, the northern part of the area could not be managed to preserve its wilderness values.

Under the partial alternative, the southern part of the WSA would be manageable as wilderness, but it would be difficult to preserve wilderness values if the private inholdings were not acquired and owners chose to develop them. One owner has raised the possibility of selling some of the land for cabin sites.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of leaving the area open for exploration and possible development of potential mineral resources would outweigh the benefits of preserving the area's wilderness values.

The WSA adjoins an active gold, silver and copper mine, contains 85 mining claims and is considered to have high potential for mineral development.

The area's wilderness qualities are limited by the absence of outstanding opportunities for solitude and the effect of developments and activities outside the area on solitude and naturalness. The WSA has some places where a visitor can achieve a sense of solitude; however, opportunities for solitude are not outstanding.

Most of the WSA is an east-facing slope, and most of the area is influenced by the imprints of man. Many of these developments are major, consisting of hydroelectric dams, 350-kV powerlines, roads, major reservoirs (Oxbow and Hells Canyon Reservoirs), power substations, a bridge and highways. A visitor's perception of the opportunities for solitude and naturalness is greatly diminished by these man-made features.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

When only developments inside the WSA are considered, the WSA appears to be generally natural. The three developments within the WSA are substantially unnoticeable. They are one short (400-foot) gap fence and two developed springs. They are well screened by vegetation and topography, and their combined influence is negligible.

Developments outside the WSA can be seen or heard from most of the area. The effect on the area's apparent naturalness is substantial . Nearly all the developments are within one mile of the WSA.

The outside sights and sounds come from fences, water developments, including the Hells Canyon and Oxbow Reservoirs on the Snake River, various structures, including a dam and powerhouse, powerlines, buildings and bridges, and roads and ways. These outside influences are concentrated along the northern two-thirds of the WSA and its southwestern corner. An area in the southern one-third of the WSA is not affected by external developments.

A visitor traversing the main hogback ridge would not be screened from these outside influences, except in small timbered areas. In several locations the west boundary is less than 500 yards from the main ridge, providing the visitor almost no area screened from man-made improvements.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The WSA does not provide outstanding opportunities for solitude. Although there are areas where a visitor can find solitude, these areas are small, scattered and too few to be considered outstanding.

Several recreation opportunities in the WSA are considered to be outstanding. Availibility of game animals is excellent. People come from several states to hunt elk and bear, and chukar hunting is unsurpassed. Hunting seasons occur in the area from mid-August to January.

Backpacking opportunities are excellent. The area offers a 10-mile trek along a knife-edge ridge that plunges dramatically to each side. Access to this ridge for backpacking, while easy from the west-central area, is extremely difficult, even dangerous, from the east side.

The deeply incised side creek drainages create spectacular relief. These features and the area's diverse flora and fauna create outstanding opportunities for the nature photographer.

The WSA offers exceptional sightseeing opportunities; the view from the main ridge is spectacular. To the northeast in Idaho, the visitor can see Idaho's Seven Devils Mountains; to the northwest, snow-capped peaks of Oregon's Wallowa Mountains dominate the surrounding view.

Vehicle access to the study area is readily available at the base of the steep east and south sides. The west side is not as rugged, but it requires crossing North Pine Creek, which has only one bridge. The west is also more heavily forested, making foot travel difficult.

Special Features

A plant species found in the area is of special interest, *Allium madidum*. This plant is discussed further in the Vegetation section.)

Many unusual plant species and specialized plant communities occur in or near the Snake River Canyon. A high concentration of endemic species generally results in many one-of-a-kind plant associations or communities. The Snake River Canyon is second only to the Siskiyou Mountains in the Pacific Northwest in this regard.

The Snake River Canyon is important not only for its unusual species, but also for its biological diversity. It is considered by many botantists to be a center of evolution for many groups of species, botanically linking the Pacific Northwest with regions far to the south, such as the Mojave Desert.

The WSA and the reach of the Snake River immediately adjacent to the east side of the area provide winter habitat for eight to 12 northern bald eagles, which are federally listed as threatened in Oregon.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system for classifying ecosystems, the WSA is in the Rocky Mountain Forest Province and has a potential natural vegetation of wheatgrass-bluegrass and grand fir-Douglas fir forest.

Seven plant communities listed in the Ochoco, Blue and Wallowa Mountain section of the Oregon Natural Heritage Plan occur in this area: Douglas fir-ponderosa pine/pinegrass, Douglas fir ponderosa pine/elk sedge, Douglas fir/mallow ninebark in the Douglas fir zone, bluebunch wheatgrass-Idaho fescue, Sandberg's bluegrass complex, big sagebrush-bunchgrass community inside forest zone, and bitterbrush/bunchgrass.

There are four standard metropolitan statistical areas with population over 100,000 within 5 hours' driving time of the WSA: Boise, Idaho; and Spokane, Yakima, and Richland/Kennewick/Pasco, Washington.

Energy and Mineral Development

The primary source for evaluation of the geologic, energy and mineral potential of the Homestead WSA was a report by WGM, Inc., a consulting firm under contract with BLM. This evaluation was compiled by WGM, Inc., from information supplied by a panel of experts in geology and minerals and by people with extensive geologic knowledge of the area. Using the WGM, Inc. evaluation, the study area was reevaluated by BLM geologists.

The study area has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is rated highly favorable for the occurrence of gold and copper.

The mineral potential classifications for the WSA are shown in table 3.

The area in and around the Homestead WSA contains approximately 45 identified metallic mineral occurrences and deposits. One operating gold-copper mine is located on the eastern border of the WSA. Copper is a strategic and critical mineral and also has high favorability for occurrence in the entire WSA. All of the metallic mineral occurrences are within the Seven Devils Groups of Permian and Triassic rocks that underlie the entire area.

As of January 1, 1984, there were 85 mining claims located within or partially within the Homestead WSA and no geothermal or oil and gas leases. The western part of the Homestead WSA is covered by a cap of Miocene basalts. These Miocene basalts consist of many superimposed flows of brownish olivine basalts. These rocks have been greatly warped and cut by steeply dipping normal

Table 3. Classification of Energy and Mineral Potential, Homestead WSA (OR-6-2)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, copper)	Entire WSA	4	D
Geothermal	Entire WSA	1	B
Uranium/Thorium	Entire WSA	1	C
Coal	Entire WSA	1	C
Oil/Gas	Entire WSA	1	C
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	2	B
Bentonite	Entire WSA	1	C
Zeolites	Entire WSA	1	C
Diatomite	Entire WSA	1	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

faults, trending north to northwest. The basalt on the eastern part of the WSA has been eroded, exposing the pre-Tertiary rocks. The oldest of these rocks are Permian consisting of marine volcaniclastic rock spilite, keratophytre flows and minor amounts of limestone and argillite. Other pre-Tertiary rocks exposed are Middle and Upper Triassic consisting of marine volcaniclastic rocks, spilitic flows and minor amounts of limestone.

Soils

The soils within the WSA are a complex of several major groups. They range in depth from 10 to 60 inches and have high clay contents with low rates of permeability. They are of basalt origin, have a relatively high rock content and occur throughout the rugged basalt rims and outcrops. Slopes range from 35 percent to greater than 70 percent. These soils are highly erodable.

Vegetation

Because of the ruggedness and extreme variation in elevation, the area is a complex of ecological sites. Part of this WSA is classified as a grassland and part as a forest. The drier sites are grassland and the wetter sites are forest. The climax grassland species are bluebunch wheatgrass and bluegrasses and the climax forest species are Douglas fir and the true firs. The early-seral stage grassland sites are dominated by cheatgrass and other annuals. (Seral refers to the stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable final stage in plant succession.)

The majority of the sites within the WSA are in mid- to late-seral with considerable portions in climax.

A plant species of special interest (mentioned in the Special Features section) is found in the WSA: *Allium madidum* (swamp onion). This plant is on List 1 of the Oregon Natural Heritage Plan's "Rare, Threatened, and Endangered Plants and Anials of Oregon."

Wildlife

Most of the WSA is crucial deer winter range with small portions important also to wintering elk. The forested areas are important year-long habitat for black bear. Mountain lions and bobcats are also found in the area. Because of its topography and numerous riparian zones, the WSA is rich in raptors and other nongame birds. Other wildlife common to the WSA are coyotes, blue grouse and numerous rodent species.

The northern bald eagle, federally listed as threatened in Oregon, is predominately a winter resident in the WSA.

Livestock Grazing

This WSA encompasses all or parts of seven grazing allotments; four are BLM allotments and three are Forest Service allotments. Table 4 summarizes existing livestock use in AUMs (animal unit months, the amount of forage needed to sustain a cow and a calf, or equivalent animals, for one month).

There are no proposed livestock improvements in the WSA.

The existing livestock developments (among the man-made feature mentioned in the Naturalness Section) are two developed springs and one short gap fence.

Because of the extreme ruggedness of the WSA, livestock management is done on horseback.

Table 4. Existing Livestock Use, Homestead WSA (OR-6-2)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)
Doyle Gulch (BLM) (No. 3004)	140	4/16-6/15	100	140
Hunsaker (BLM) (No. 3005)	340	4/16-6/15	60	204
Copperfield (BLM) (No. 3007)	106	4/16-6/15	60	64
McLain Creek (BLM) (No. 3045)	14	4/16-6/15	100	14
Doyle (USFS)	31	4/16-6/15	100	31
Turnbull (USFS)	188	4/16-6/15	85	160
Ghost Camp (USFS)	20	4/16-6/15	85	17
Totals	839			630

Wood Products Harvest

There are 330 acres of commercial forest land in the BLM portion of the WSA, which contribute approximately 33,000 board feet (33 Mbf) to the Vale District's annual timber yield. This represents approximately 1 percent of the total programmed harvest in the Vale District. The Forest Service portion of the WSA has no commercial timber.

Recreation Use

Big game (elk and deer) and upland birds (chukar) hunting are the largest recreational activities in the WSA. They account for high hunting use. Additional visitation is associated with backpacking, photography, rockhounding and sightseeing. Little of the recreation is associated with vehicles. Some backpackers and hunters have been irritated at vehicle use on the ridgetops. Some incidental day use, i.e, day hiking and some rockhounding, may be the result of the WSA's proximity to Hells Canyon Reservoir and the Hells Canyon NRA.

Economic Value and Local Income

Livestock grazing, timber, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Homestead WSA (OR-6-2) (1981 price levels)

Actual Use Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	630	$4,750	$7,358
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Timber	MBF	33	1,815	6,630
Total			$6,565	$13,988

discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 13,975 acres (6,321 BLM and 7,654 Forest Service) to the National Wilderness Preservation System (NWPS). The WSA's outstanding scenery, backpacking and hunting opportunities and other wilderness values--such as the plants of special interest and the wintering bald eagles--would be preserved in most of the WSA.

While wilderness designation would protect these values from most activities, the potential for mineral development both inside and adjacent to the WSA is high. There are 85 unpatented mining claims in the northern portion of the WSA. If mining claims which existed at the time the area was designated wilderness were determined to be valid, mineral development, including road construction, buildings, mine portals and dumps, holding ponds and associated human activity, could adversely affect wilderness values in that part of the WSA.

Access to and development of the two private inholdings could adversely affect wilderness characteristics. Landowners have shown interest in the past for access and development, including a subdivision. Road construction, with cuts and fills, could have a substantially noticeable impact upon the area's naturalness.

Because of the effects of outside sights and sounds and the high potential for mineral development, the northern portion of the area would not be manageable as wilderness.

The **partial alternative** would add 8,775 (2,255 BLM, 6,200 USFS) acres to the NWPS, assuming the 320 acres of private land could be acquired.

Under this alternative, mining claims in the nonsuitable northern portion could be developed without regard for effects on wilderness values; this would adversely affect naturalness in that portion of the WSA. The impacts of mining claims, existing at the time the area is designated wilderness, would be similar to those under the all wilderness alternative, except they could be more pervasive. This is because, in this alternative, the claims could continue to be developed regardless of whether their validity could be established at the time of wilderness designation. In addition, new claims could be located and developed without regard to effects on wilderness values. Such development could substantially affect the area's naturalness.

If valid mining claims were established before the area was designated wilderness, the impacts of mining in the suitable portion would be the same as those under the all wilderness alternative. There were no mining claims in that part of the WSA as of January 1, 1984.

Acquisition of the private inholdings under this alternative would preclude adverse effects related to their access and development.

Timber harvest on about 330 acres of commercial forest land would adversely affect naturalness in the nonsuitable portion.

Adverse effects of ORV use on naturalness, recreation and special features in the nonsuitable portion would consist mainly of annoying noise. Physical damage would be minor as the only areas suitable for riding are ridge tops, a forested flat and spur roads along the northern boundary.

The animals of special concern could be adversely affected in the nonsuitable area by potential mining and road construction and the constant presence of human activities associated with mineral development. Except for mining of valid claims, these animals would be protected in the suitable portion.

Under the **no wilderness/no action alternative**, impacts on wilderness values throughout the area would be similar to those for the nonsuitable portion in the partial alternative. There is a greater potential for mining activities in the northern half of the WSA, and therefore a greater chance that wilderness values in that part of the WSA would be adversely affected. ORV use would be limited to existing trails, but it would detract from the quality of primitive recreation activities in the area.

Effects on Energy and Mineral Development

The portion of the WSA in the Hells Canyon National Recreation Area is already withdrawn from mineral exploration and development. Additional areas designated wilderness would be withdrawn as follows: 8,561 acres under the **all wilderness alternative**; and 4,235 acres, plus an additional 320 acres if private land is acquired, as proposed under the **partial alternative**. The withdrawals would include the area rated high for gold and copper, which encompasses the entire WSA. The mineral withdrawal associated with wilderness designation would be a substantial impact to development given the WSAs high favorability and likelihood for development.

No additional acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Soils

Under the **all wilderness alternative**, any mining operations on valid claims would have a high potential for soil disturbance. The disturbance would be confined to a relatively small area and could include road cuts, fills, tunnels, dumps, etc., which remove soil, cause slumps and expose soil to water and wind erosion. Due to the fragile and highly erodable soil and steep slopes it would be difficult to rehabilitate most disturbance.

Under the **partial alternative**, the nonsuitable area appears to have the highest mineral potential and the greatest potential for soil disturbance. Because of the extremely steep slopes, any ground disturbance would contribute to irreparable soil loss. In the suitable area, mining would be limited to valid claims. Mining and associated construction could cause substantial localized soil disturbance. These impacts could include water erosion due to loss of vegetation, slumping or sloughing, and wind erosion.

Under the **no wilderness/no action alternative**, the entire area would be open to mineral exploration and development. Mining impacts would be the same as for the nonsuitable portion of the partial alternative. Impacts from timber harvest on soils would vary, depending on the method of removal. Mitigating measures addressing specific impacts would be included in a timber environmental analysis.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

In the nonsuitable northern portion of the WSA, under the **partial alternative**, mining operations, increased road building and vehicle access would occur that would have adverse impacts on both wildlife habitats and populations. Because the area is highly mineralized, there is a great potential for future large scale mining operations; expansion of an existing mining operation is also highly probable. With increased human activity, harassment and poaching would increase, and habitat would be lost.

Because of the current optimum condition and distribution of forage and cover, timber harvest on 330 acres would diminish the amount of cover for deer and elk over the short term. In the long term (over 20 years) these areas would again provide cover. Wildlife species such as blue and ruffed grouse that are dependent upon ecotones (transition zones between two plant communities) could be displaced due to loss of winter habitat through timber harvest. Species dependent upon old growth timber, such as the pileated woodpecker, would be displaced when harvest occurs in the old growth forest. Populations of cavity-nesting species such as saw-whet owls, flying squirrels, and flickers and nuthatchers would decline due to the loss of snags and potential snags.

Under the **no wilderness/no action alternative** effects on species dependent upon ecotones would be the same as in the nonsuitable portion of the partial alternative. During the short term (five years) following timber removal, animal populations would decline. Over the long term (10 years plus), habitat would generally improve with additional grass and brush forage encouraged by overstory removal. With habitat improvement, game populations would increase.

Effects on Wood Products Harvest

The **all wilderness alternative** would preclude harvest of the commercial timber within the study area. Harvest of an average 33 Mbf per year would be foregone.

Under the **partial and no wilderness/no action alternatives**, timber would be harvested and would yield an average of 33 Mbf per year (approximately 1 percent of the total programmed harvest in BLM's Vale District.)

Effects on Recreation Use

Under the **all wilderness alternative** and in the suitable portion of the partial alternative, hikers and hunters would benefit from the reduction of the minor conflicts with off-road vehicles. Hunting is primarily on foot or horseback due to the ruggedness of this area and the lack of roads.

Consequently, hunting use would not change under the all wilderness and partial alternatives. Overall recreation use would remain near present levels.

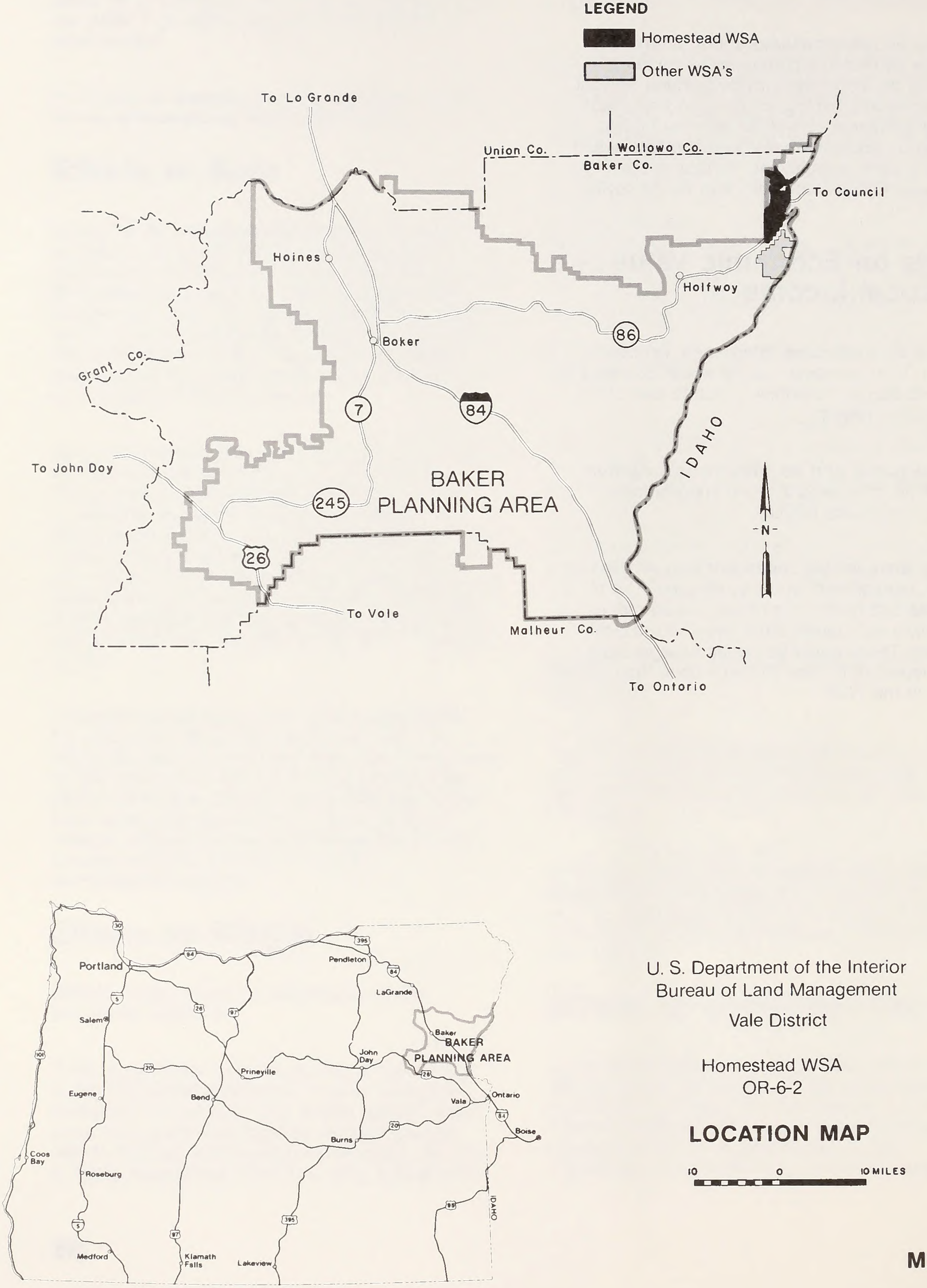
Under the **no wilderness/no action alternative** and in the nonsuitable portion of the partial alternative, development, including timber harvest on 330 acres and mining, could open new roads providing additional access for vehicle-oriented recreation. In addition, these developments would reduce big game populations, thereby decreasing hunting use. Overall recreation use would decline slightly.

Effects on Economic Value and Local Income

Under the **all wilderness alternative**, economic value and local personal income would decrease by $1,815 and $6,630, respectively, due to loss of 33 Mbf in timber harvest.

Under the **partial and no wilderness/no action alternatives**, there would be no impacts from changes in resource outputs.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness and partial alternatives would restrict such vehicle use unless there were no practical alternative. There would be no increase in costs and no impact from road closures upon the grazing operator in the WSA.

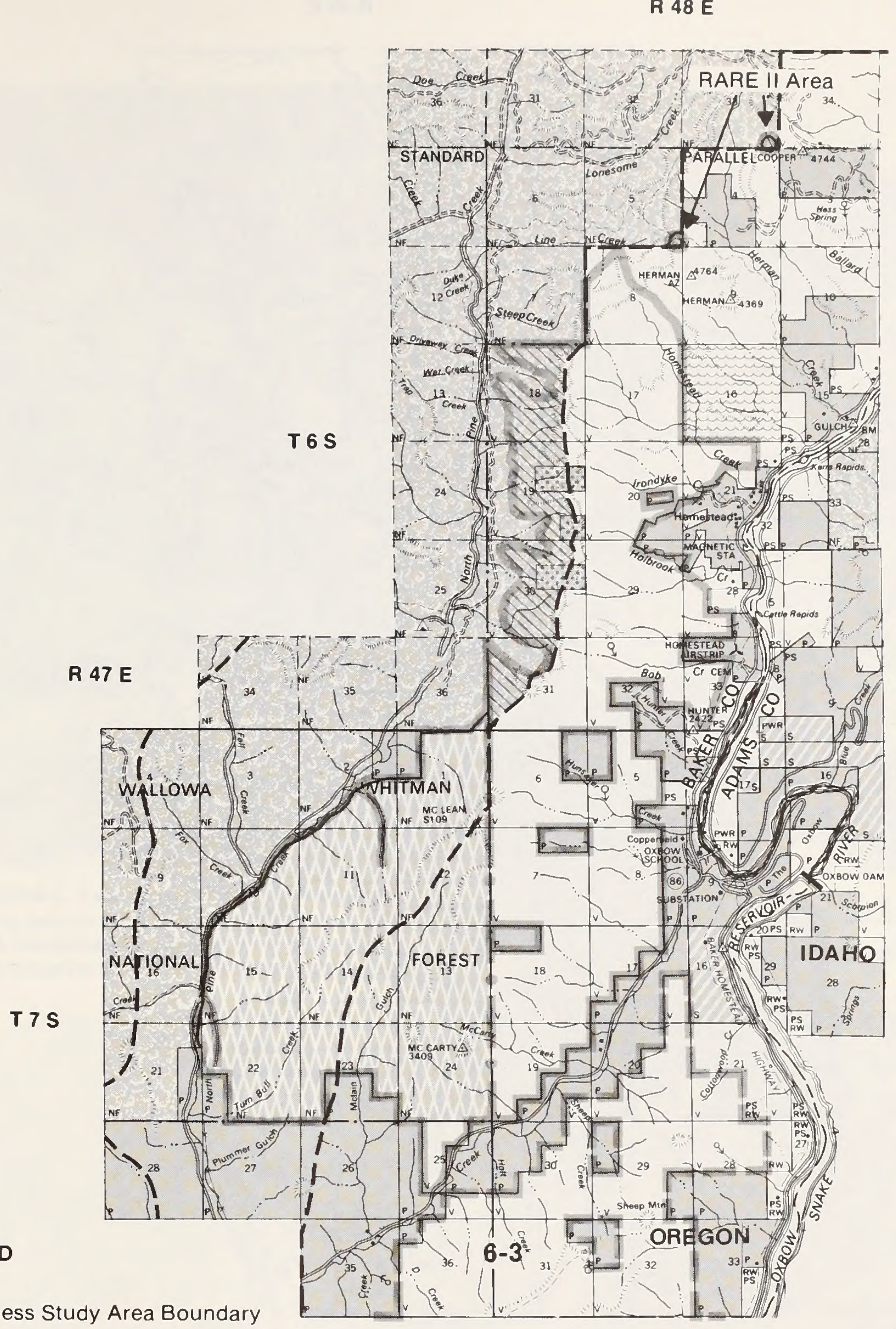


U. S. Department of the Interior
Bureau of Land Management
Vale District

Homestead WSA
OR-6-2

LOCATION MAP

MAP 1



LEGEND

- Wilderness Study Area Boundary
- Boundary of Joint FS Study Area
- Boundary of Adjacent Wilderness Study Areas
- Boundary of Hells Canyon NRA
- ☐ Bureau of Land Management
- ▨ State
- ■ Private
- ▒ U.S. Forest Service
- ☐ BLM Surface-State or Private Subsurface (Split Estate)
- ▒ RARE II Area Designated for Further Planning
- ▨ Lands within WSA Transferred to USFS
- ░ USFS Acquisitions (Formerly Private Lands)

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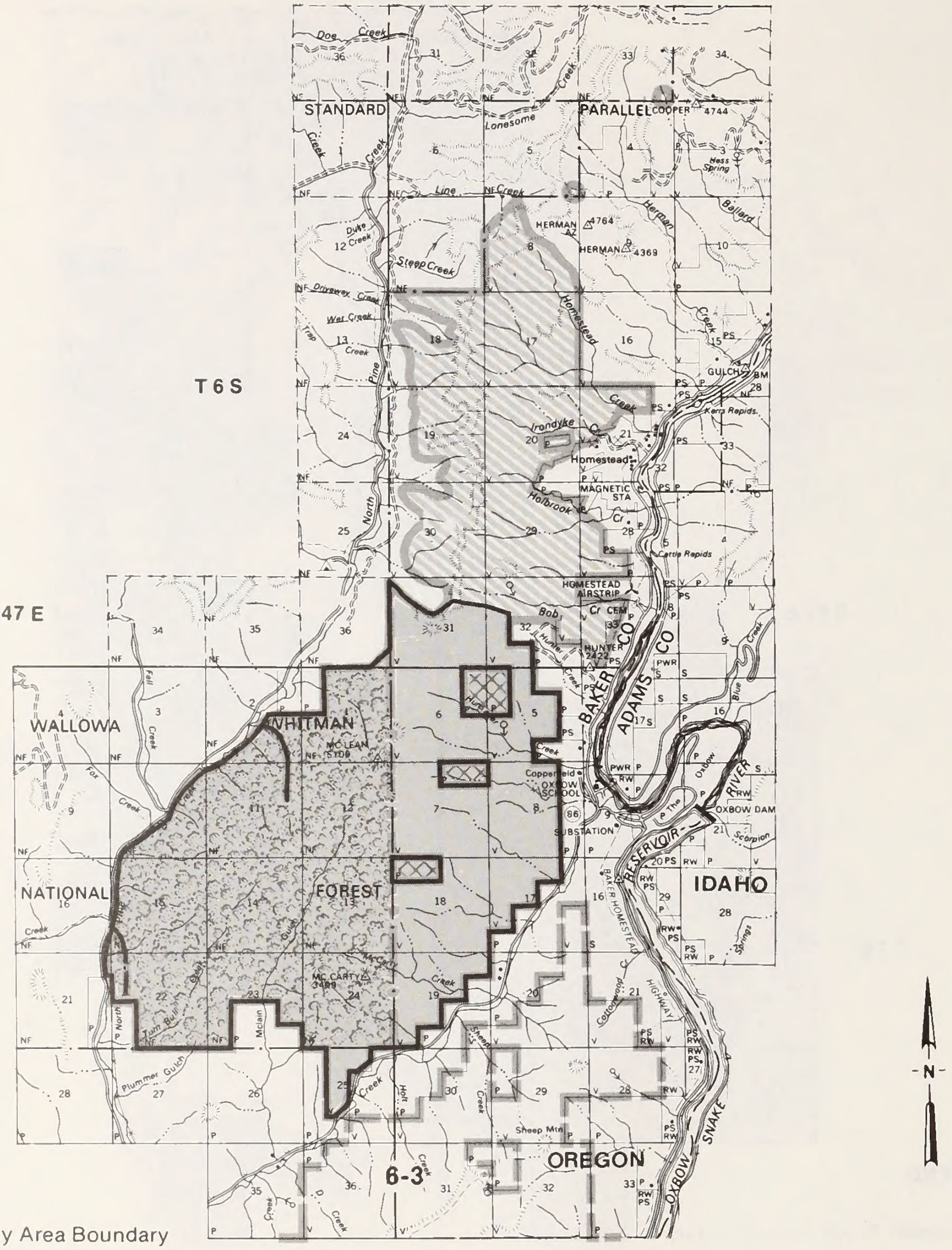
Vale District

Homestead WSA
OR-6-2

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

▬● Boundary of Joint FS Study Area

▬ ▬ Boundary of Adjacent Wilderness Study Areas

▭ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▒ National Forest Service Land within Recommended Wilderness

▩ Non-Federal Land within Recommended Wilderness

U.S. Department of the Interior
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Vale District

Homestead WSA
OR-6-2

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3

Homestead WSA, OR-6-2. East side of WSA looking west at Holbrock Creek from across Hell's Canyon Reservoir. Within area recommended nonsuitable under the partial and preferred (no wilderness/no action) alternatives. October 1983.

Homestead WSA, OR-6-2. East side of WSA looking southwest from across the Snake River on the Idaho side. Within area recommended nonsuitable under the partial and preferred (no wilderness/no action) alternatives. Iron Dyke Mine is visible at photocenter, the community of Homestead is visible at the lower left and Hells Canyon reservoir is visible in the foreground. October 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Sheep Mountain Wilderness Study Area (OR-6-3)

General Description of Study Area

The Sheep Mountain wilderness study area (WSA) is located along Oregon State Highway 86, 65 miles northeast of Baker, Oregon, and 15 miles east of Halfway, Oregon, in Baker County. The community of Copperfield is 1 1/2 miles north of the study area (see map 1).

This WSA contains 7,040 acres of public land and two parcels of private land totaling 200 acres located in the north-central portion of the area (see map 2). The study area is almost entirely surrounded by private land; public land borders the southeastern portion of the WSA for 2.5 miles.

At its longest point, the area is 6 miles from north to south; it is 3 miles wide at its southern boundary and tapers to 1/4 mile wide on the north.

The WSA is dominated by Sheep Mountain, which towers 3,000 feet above the Snake River. The area is bordered on the west and northwest by the Pine Creek drainage which forms a dramatic vertical ascent.

The slopes of the area are extremely steep to the west, north and east. An exception is in the southwest portion where a ridgetop forms a more rolling landscape. A road traverses this ridgetop and terminates at the border of the study area. A way (a vehicle route established and maintained solely by the passage of vehicles) then proceeds for approximately one mile north into the area, where a trail leads into the middle of the WSA.

Several seasonal creeks drain all sides of Sheep Mountain. Black Canyon Creek is the only perennial stream in the WSA. Black Canyon is a deeply incised drainage flowing north to south through the southern half of the area. A flat bench surrounds the headwaters of Black Canyon Creek creating a high 1,200-acre plateau.

Several basalt pinnacles are evident on the northwest exposure of Sheep Mountain. On the north and east slopes, layers of basalt terrace the mountain from top to bottom.

The plant community on the flat bench area on top of Sheep Mountain is comprised primarily of big sagebrush, squaw currant, snowberry, buckwheat and bluebunch wheatgrass. Small stringers of Douglas fir clutch the steep slope northeast of the flat. Grassy slopes consisting of Idaho fescue and bluebunch wheatgrass are found on the south and west aspects immediately adjacent to the flat.

Interrelationships

Sheep Mountain WSA lies 1/2 mile southeast of the Homestead WSA (OR-6-2) and Hells Canyon National Recreation Area. A combination of relatively continuous national forest and BLM wilderness and BLM wilderness study areas extend approximately 60 miles along the west side of the Snake River from the mouth of the Imnaha River to immediately north of the Brownlee Dam.

A Forest Service radio repeater station is located near the summit of Sheep Mountain. A helicopter is used to transport maintenance personnel to the repeater twice a year, and the maintenance visits last about two hours.

A portion of the WSA near the Snake River is part of a power site reserve and Federal Energy Regulatory Commission classification which earmark the land for potential water power and water storage development. These 'withdrawals' are scheduled for review in the next few years, which may lead to their revocation. Power site development has already placed the Oxbow Reservoir on the river below this WSA, but it is not inundating any of the WSA. Such development is, therefore, not discussed further.

The entire WSA falls within lands which were ceded to the U.S. Government by the Nez Perce Indian Tribe by ratified treaty. This treaty reserved rights for hunting, fishing, and gathering in usual and accustomed places and grazing livestock on unclaimed land.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- continued use of helicopter flights to service the the Forest Service's radio repeater in the WSA (Maintenance by helicopter of the existing Forest Service radio repeater tower would continue under all alternatives. This could adversely affect solitude for a maximum of four hours a year. It would be possible to lessen this impact by scheduling the maintenance to avoid the recreation use seasons. This issue is not discussed further in this appendix.),

- off-road-vehicle (ORV) use of a trail in the WSA,

- access to private land,

- development of potentially important mineral resources, and

- wintering bald eagles and a plant species of special interest in the WSA.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness (preferred alternative)
- no wilderness/no action

A partial alternative is not analyzed; the effects of resolving resource conflicts by recommending part of the area nonsuitable for wilderness would not be substantially different from the enhanced wilderness alternative.

All Wilderness

Under the all wilderness alternative, all 7,040 acres of public land in the Sheep Mountain WSA would be recommended suitable as wilderness (see map 2). For purposes of analysis, it is assumed the two parcels of private inholdings would not be acquired.

Enhanced Wilderness (Preferred Alternative)

Under the enhanced wilderness alternative, 6,140 acres of public land would be recommended suitable as wilderness (see map 3). In addition, an attempt would be made to acquire the 200 acres of private inholdings through purchase or exchange with willing owners. Assuming acquisition of these inholdings, the total area recommended suitable under this alternative would be 6,340 acres.

Some 900 acres would be recommended nonsuitable. The 900-acre area is a narrow extension of the WSA which would be difficult to manage as wilderness. The boundary between the suitable and nonsuitable portions would be along a sharp ridgeline.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- vehicles restricted to existing routes, and

- continued availability for mineral exploration and development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area would be manageable as wilderness. However, it might be difficult to manage a narrow, 900-acre extension in the northern part of the WSA to preserve its wilderness values. Manageability of the area's wilderness values would be improved under the enhanced wilderness alternative by eliminating this 900-acre extension, which would be difficult to manage as wilderness because of its narrow, irregular configuration, the adjacent private land, and the lack of an identifiable boundary.

Table 1. Summary of Proposed Management Under Each Alternative, Sheep Mountain WSA (OR-6-3)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	7,040	6,140	0
Acres Closed to ORVs by Wilderness Designation	7,040	6,140	0
Miles of Ways Closed	0.3	0.3	0
Acres of Full Fee Estate Acquired[1]	0	200	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	7,040	6,140	0

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

A problem could arise in management of the area recommended suitable for wilderness in the enhanced wilderness alternative if owners of the two private inholdings were to develop access, harvest timber or mine. Acquisition of the inholdings would preclude potential activities not consistent with wilderness management.

Rational for Selection of the Preferred Alternative

The enhanced wilderness alternative is preferred because the benefits of preserving the area's varied wilderness values would outweigh the benefits of retaining options for development of potential mineral resources. The WSA has several important special wilderness features, including a plant species of special interest and wintering bald eagles.

The WSA offers outstanding elk and deer hunting. It also provides some of the finest chukar hunting in the United States. Day hiking and backpacking opportunities are outstanding. The extremely rugged topography, with deeply incised canyons, jagged, steeply terraced slopes, colorful rock formations and unobstructed views of the Wallowa Mountains in Oregon and Seven Devils in Idaho, provide the sightseer with unsurpassed scenic and photographic opportunities.

The 900 acres recommended as nonsuitable form a very narrow extension of the WSA bordered on three sides by private land. This portion is also heavily affected by sights and sounds outside the WSA (powerlines, roads, Oxbow Dam and ways). There are few opportunities for solitude or primitive recreation in this part of the WSA. The ridgeline which forms the boundary between the suitable and nonsuitable portions screens the outside sights and sounds from the portion recommended suitable for wilderness.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Table 2. Summary of Environmental Consequences of Alternatives, Sheep Mountain WSA (OR-6-3)

Resource or Activity	All Wilderness	Enhanced Wilderness (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 7,040 acres to NWPS. Preserves wilderness characteristics of highly natural area, outstanding solitude, excellent hiking, backpacking, hunting, sightseeing and rockhounding, plant species of special interest and bald eagle habitat. The area is manageable as wilderness, but northern extension (900 acres) could be difficult to manage.	Would add 6,340 acres to NWPS, assuming the 200 acres of private inholdings could be acquired. Preserves all major wilderness characteristics as in the all wilderness alternative. Acquisition of private parcels would preclude potential development and impacts to wilderness characteristics. Area would be manageable as wilderness.	ORV use, limited to existing trail, would continue to affect opportunities for solitude and primitive recreation. Development of minerals could adversely affect naturalness, solitude and bald eagles, depending on location, duration and level of activity.
Energy and Mineral Development	Development precluded on 7,040 acres, including 7,040 acres with moderate potential for metals.	Development precluded on 6,140 acres, plus an additional 200 acres if acquired; includes 6,140 acres with moderate potential for metals.	No impact.
Livestock Grazing	Increase of 30 AUMs might be foregone.	Same as all wilderness.	30 AUM increase likely.
Recreation Use	Trail and way closed to ORVs, eliminating conflicts between ORVs and other users. No change in overall recreation use.	Same as all wilderness.	Trail would remain open for motorcycle use. Way open for motorized access. No change in overall recreation use.
Economic Value and Local Income	Increase in local personal income and economic value by $350 and $226, respectively, if grazing increases from improved livestock management were allowed. No change in local personal income or economic value if the increases through management were not allowed.	Same as all wilderness.	Increase in local personal income and economic value by $350 and $226, respectively, from grazing increases based on improved livestock management.

Wilderness Values

Naturalness

Man-made features are generally unnoticeable throughout the Sheep Mountain study area. Five developments within the WSA affect the area's naturalness: a hiking and motorcycle trail, radio repeater station, log cabin, spring development and a way extending 0.3 miles into the southern end of the WSA. They are fairly well dispersed, influencing approximately 10 percent of the WSA. (The area of influence is an estimate of the acreage within the WSA from which these man-made features can be seen.)

With the exception of the radio repeater, these internal features are well screened by topography and vegetation. The radio repeater site sits on top of a knoll near the area's summit and can be seen from much of the summit; however, due to its small size and color, it is a minor intrusion.

Developments outside the area, but which can be seen from within the area, include fences, Brownlee, Oxbow and Hells Canyon reservoirs on the Snake River, houses, resorts, powerlines, dams, and roads. All of the outside influences are located within two miles of the WSA.

For the most part, the portions of the WSA most heavily influenced by the outside developments -- the steep slopes facing the developments -- are the portions least likely to be used by wilderness visitors. The developments cannot be seen from the relatively flat top of Sheep Mountain.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude and primitive recreation are outstanding in portions of the WSA where topography or vegetation screen the visitor from outside sights and sounds and other users. The deeply cut drainages and dense riparian vegetation in the northern portion of the area provide both topographic and vegetative screening.

The best places to find seclusion within the WSA are at the head of Sheep Creek, the head of Black Canyon Creek and its associated flat, and in the southwest corner of the study area. A combination of coniferous vegetation and topography along upper Sheep Creek screen human disturbances from view. Topography provides screening in upper Black Canyon Creek. This large, flat basin is encircled by a slightly higher lip formation which confines the visitor's view to the basin and higher elevations outside the area.

The northern extension of the study area consists of a narrow, north-south ridge. There is no vegetative or topographical screening to lessen the influence from outside sights and sounds present on both sides of the ridge. These sights and sounds (roads, traffic, boating use, powerlines, etc.) are inescapable.

The Sheep Mountain hiking trail traverses the part of the WSA which is most screened from activities outside the WSA. The 3-mile trail starts in the southwest corner of the WSA and ends at a cabin at the head of Sheep Creek.

Day hiking and backpacking opportunities are outstanding in all but the northern extension of the WSA. There is good vehicular access to the south, with a road approaching the hogback ridge. Sightseeing and big game and upland bird hunting are excellent. The area is inhabited by deer, elk and countless chukar partridge.

Special Features

Many unusual plant species and specialized plant communities occur in or near the Snake River canyon. A high concentration of endemic species generally results in many one-of-a-kind plant associations or communities. The Snake River Canyon is second only to the Siskiyou Mountains in the Pacific Northwest in this regard.

A plant species of special interest, *Allium madidum*, has been identified in the study area. (See the Vegetation section for more information.)

The Snake River Canyon is also important for its biological diversity. It is considered by many botanists to be a center of evolution for many groups of species, botanically linking the Pacific Northwest with regions far to the south, such as the Mojave Desert.

The Snake River is immediately adjacent to the east side of the area, and provides wintering habitat for 20 to 30 northern bald eagles, federally listed as threatened in Oregon. In addition, a bald eagle roosting area has been located 300 yards outside of the WSA's eastern boundary.

The WSA also contains two known cultural resource sites.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the WSA is in the Northern Rocky Mountains Forest Province, and the potential natural vegetation in the WSA is wheatgrass-bluegrass. Plant communities listed in the Ochoco, Blue and Wallowa Mountains section of the Oregon Natural Heritage Plan and found in the WSA include: ponderosa pine-Douglas fir/ninebark, bluebunch wheatgrass-Sandberg's bluegrass, Idaho fescue-bluebunch wheatgrass, big sagebrush/bunchgrass in forest zone, and bitterbrush/bunchgrass.

There are four standard metropolitan statistical areas with population over 100,000 within five hours' driving time of the WSA: Boise, Idaho; and Spokane, Yakima, and Richland/Pasco/Kennewick, Washington.

Energy and Mineral Development

The primary source for evaluation of the geologic, energy and mineral potential of the Sheep Mountain WSA was a report by WGM, Inc., a consulting firm under contract with BLM. The information was re-evaluated by BLM minerals personnel.

The WSA has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is classified as having moderate favorability for the occurrence of gold and copper. Copper is a strategic and critical mineral rated moderate, but there are no known deposits of strategic and critical minerals in this WSA.

Table 3 shows the mineral potential classifications of the WSA.

There were no mining claims in the WSA as of January 1, 1984, and no oil and gas or geothermal leases as of that date.

Table 3. Classification of Energy and Mineral Potential, Sheep Mountain WSA (OR-6-3)

Commodity	Area	Classification Level	Confidence Level
Metals (gold and copper)	Entire WSA	3	B
Geothermal	Entire WSA	1	B
Uranium/Thorium	Entire WSA	1	C
Coal	Entire WSA	1	C
Oil/Gas	Entire WSA	1	C
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	2	B
Bentonite	Entire WSA	1	B
Zeolites	Entire WSA	1	B
Diatomite	Entire WSA	1	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

The surface geology of Sheep Mountain consists of many gently warped flows of brownish olivine Tertiary basalts. The flows are more than 2,000 feet thick and are underlain by pre-Tertiary, Permo-Triassic volcanic and volcaniclastic epiclastic carbonate rocks. This rock is exposed just above the high water level of the Snake River in the southeast corner of the WSA.

Vegetation

Vegetation in the WSA is grassland with many ecological range sites, most of which are in a mid- to late-seral stage with portions in climax. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.)

The area is a transition zone extending from grassland to shrub to forest. Primary species are bluebunch wheatgrass, buckwheat, big sagebrush, snowberry and Douglas fir.

A plant species of special interest (mentioned in the Special Features section) is found in the WSA: *Allium madidum* (swamp onion). This plant is on List 1 of the Oregon Natural Heritage Plan's "Rare, Threatened, and Endangered Plants and Animals of Oregon."

Wildlife

Approximately 25 to 40 elk and 50 to 150 deer utilize the area for summer habitat. Blue grouse, chukar and Hungarian partridge providing excellent hunting in the WSA.

Cliffs, rimrock draws and forested areas attract numerous small nongame birds and mammals and birds of prey, including northern bald eagles (federally listed as threatened in Oregon), red-tailed hawks, American kestrel, sharp-shinned hawk and Cooper's hawk.

Livestock Grazing

A portion of one grazing allotment is within the WSA. Table 4 summarizes current and potential livestock use in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

Most of the area is unsuitable for grazing because of very steep slopes. One developed spring (mentioned among the man-made features in the Naturalness section) is located in the WSA and present plans are to maintain this development using hand labor. No other livestock projects are proposed. There is potential over the long term for an increase of 30 AUMs in forage allocation from improved livestock grazing management and improvement in range condition.

Horses are used to move cattle to and from the area and to place salt.

Cultural Resources

One prehistoric site has been found in the area. The site contained one small projectile point and several flakes of obsidian.

An old log cabin is located on public land

Table 4. Existing and Potential Livestock Use, Sheep Mountain WSA (OR-6-3)

Grazing Allotment	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs)
Pine Valley (No. 3001)	4/16-6/15	20	30	30

approximately 300 yards south of a private parcel near the center of the WSA.

Recreation Use

Big game (elk and deer) and upland bird (chukar) hunting are the most popular recreational activities in the WSA. It is estimated that hunting accounts for high use. Other recreation includes day hiking, photography, rockhounding and sightseeing. Although an occasional motorcyclist uses the southern trail, most recreation is not associated with vehicles.

Some day hiking and rockhounding occur because of the WSA's proximity to Hells Canyon, Oxbow and Brownlee reservoirs and Hells Canyon National Recreation Area. Oregon jade, green moss agate, jasper agatized wood and thunder eggs have been found in the area.

Economic Values and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984 there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 30 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $226 annually, and local personal income generated by existing outputs amounts to $350 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 7,040 acres to the National Wilderness Preservation System (NWPS). The area's outstanding day hiking, backpacking, hunting, sightseeing, rockhounding and solitude opportunities, high degree of naturalness, scenery, and special wilderness features (unusual plants and plant communities and bald eagle habitat) would be protected.

If owners chose to develop inholdings in the WSA, wilderness values would be adversely affected. The inholdings are now used in much the same way as surrounding public land, and there are no indications that the use will change in the foreseeable future.

The **enhanced wilderness alternative** would add 6,340 acres to the NWPS, assuming the 200 acres of private inholdings were acquired. The impacts for the suitable area would be similar to the all wilderness alternative. In addition, acquisition of the two private parcels would preclude potential activities and developments which might impair the area's wilderness values.

The few wilderness values on the 900-acre northern extension recommended as nonsuitable could be adversely affected by mineral development. Due to steep and rugged terrain, there is little likelihood of any other kinds of development in the area.

Under the **no wilderness/no action alternative**, mineral development could adversely affect wilderness values, including the area's special wilderness features and opportunities for solitude and primitive recreation. If mining activity were to occur, it would probably take place at a low elevation near the boundary. This is due to the thickness of the basalt cap which covers the mountain.

Under the no wilderness/no action alternative, the ORV limitations would remain in effect, restricting use to the existing trail. Noise from an infrequent motorcycle on the trail would continue to disturb a visitor's sense of solitude.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 7,040 acres under the **all wilderness alternative**, and 6,140 acres, plus an additional 200 acres if the private inholdings are acquired, as proposed under the **enhanced wilderness alternative**.

These withdrawals would include the area rated moderate for gold and copper, which encompasses the entire WSA.

While there is moderate potential for gold and copper over the entire WSA, development may be unlikely due to the thick basalt cap making exploration and development difficult and the lack of mineral exploration in the WSA.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Livestock Grazing

The potential 30 AUM increase might or might not be allowed under the **all wilderness and enhanced wilderness alternatives**, depending on a site-specific analysis of whether it conforms with Wilderness Management Policy.

Under the **no wilderness/no action alternative**, the increase would be allowed if the expected improvement in the grazing condition was realized.

Effects on Recreation Use

Under the **all wilderness alternative**, ORVs would not be permitted, thereby eliminating conflicts with other recreationists. Because recreation associated with ORVs is light, recreation use would remain essentially unchanged.

The impacts on recreation in the suitable portion of the **enhanced wilderness alternative** would be the same as for the all wilderness alternative. No impacts to recreation would occur on the nonsuitable area. This area provides little recreation.

Under the **no wilderness/no action alternative**, the trail and way would remain open to ORV use, thereby continuing the minor adverse impact to other users. Recreation use is not expected to change under this alternative.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known if the grazing increases would be allowed.

The column for the wilderness alternatives shows the effects as a range of values dependent upon whether grazing operator access, and/or grazing adjustments were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The **all and enhanced wilderness alternatives** would restrict such vehicle use unless there were no practical alternative. There would be no increase in costs and no impact upon the grazing operator from road closures in the WSA.

Table 5. Effects of Alternatives on Annual Economic Value, Sheep Mountain WSA (OR-6-3) (1981 price levels)

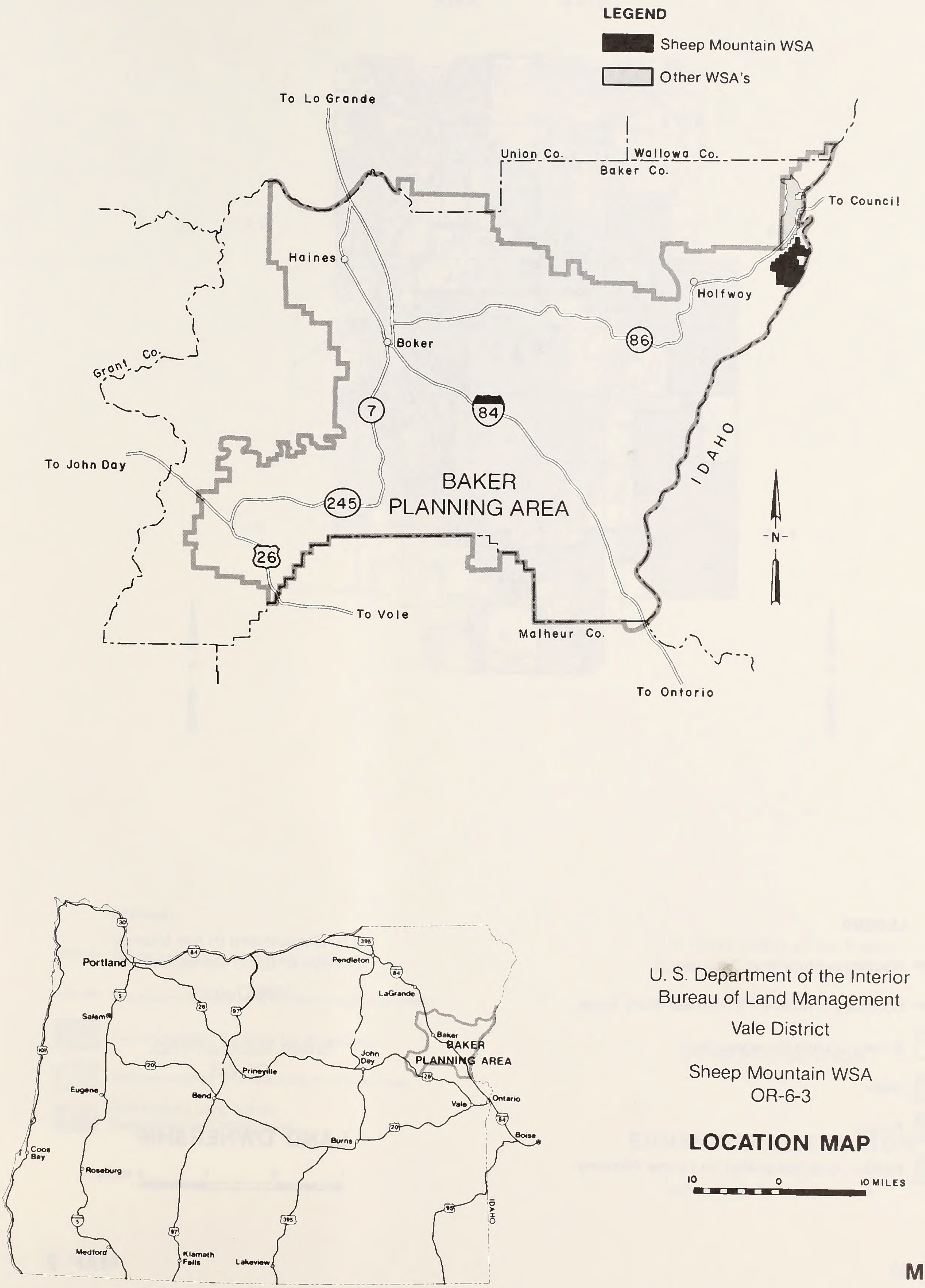
Item	Unit of Measure	Enhanced Wilderness, All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing: Management [1]	AUM	0 to +30	+30
VALUE OF EXPECTED CHANGES IN OUTPUTS			
Grazing: Management	$	0 to +226	+226

[1] Expected future increases due to improved management that is not dependent on investments.

Table 6. Effects of Alternatives on Local Personal Income, Sheep Mountain WSA (OR-6-3) (1981 price levels)

Item	Unit of Measure	Enhanced Wilderness, All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing: Management [1]	AUM	0 to +30	+30
VALUE OF EXPECTED CHANGES IN OUTPUTS			
Grazing: Management	$	0 to +350	+350

[1] Expected future increases due to improved management that is not dependent on investments.



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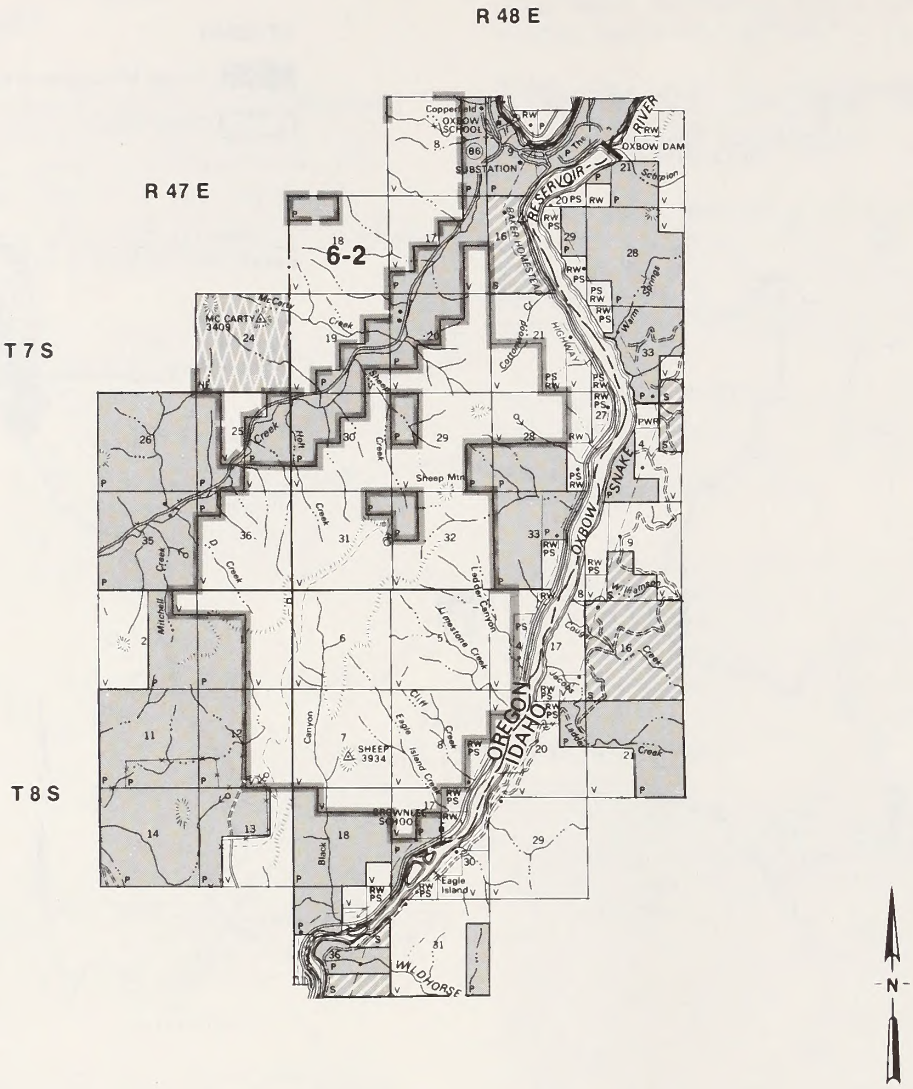
Vale District

Sheep Mountain WSA
OR-6-3

LOCATION MAP

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ State

■ Private

▩ RARE II Area Designated for Further Planning

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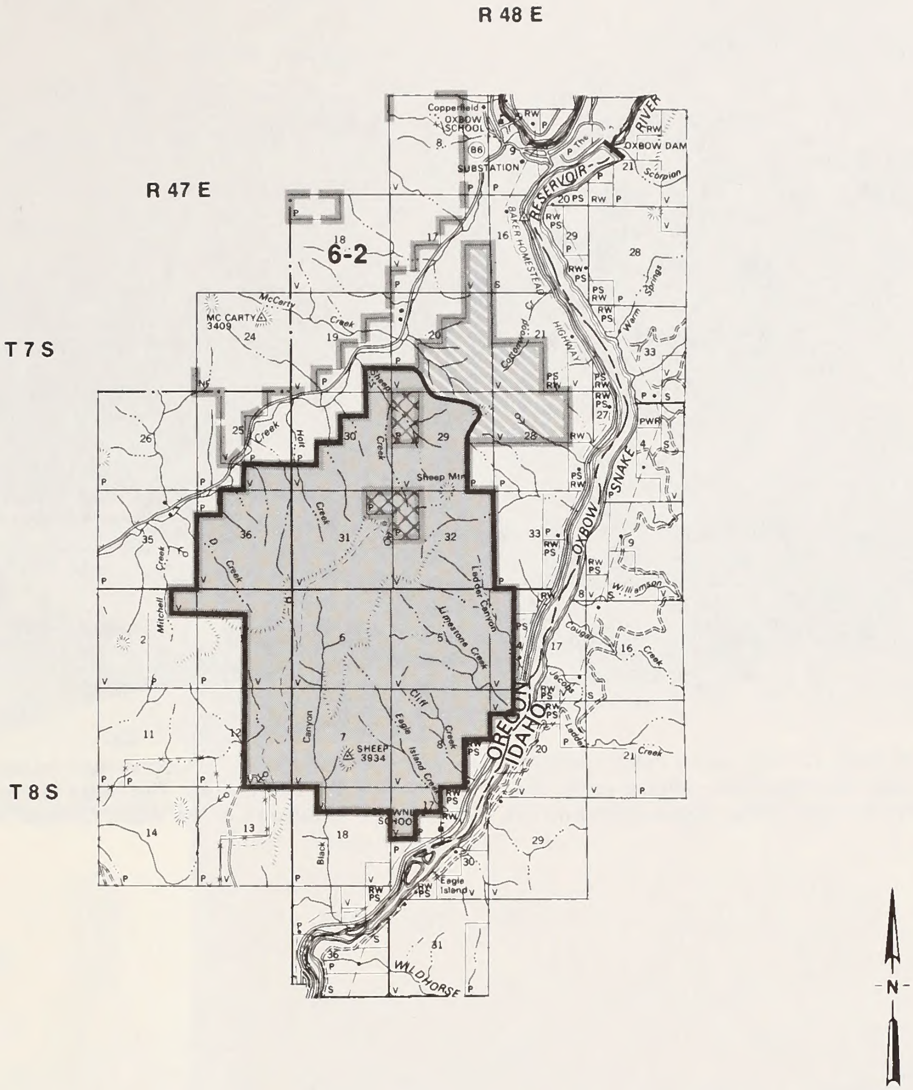
Sheep Mountain WSA
OR-6-3

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study Areas
- ▭ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness

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Sheep Mountain WSA
OR-6-3

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3

Sheep Mountain WSA, OR-6-3. North side of WSA looking south. Within area recommended suitable under the enhanced (preferred) alternative. Highway 86 and the community of Copperfield (outside the WSA) are visible in the foreground. The ridge on the left is the northern extension of the WSA. October 1983.

Sheep Mountain WSA, OR-6-3. North side of WSA looking south (community of Copperfield and Highway 86 in foreground are outside WSA). Within area recommended suitable under the enhanced (preferred) alternative. October 1983.

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MAP SYMBOLS

Road

Ways

Buildings

Fence

Corral

Pipeline

Powerline

Mine or Quarry

Reservoir or Retention Dam

Earth Tank or Charco

Perennial Stream

Intermittent Stream

Intermittent Lake or Pond

Dry Lake or Pond

Marsh

Lava

Sand

Spring

Improved Spring

Well

Artesian Well

Peak

Rims

Form 1279-3
(June 1984)
BORROW
QH 76.5 .07 073 198
Oregon wilderness
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